ADVERTISER'S COPY IN TWO PARTS — PART ONE

AIR CONDITIONING & REFRIGERATION NEWS
The Newspaper of the Industry

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Inside Dope

By GEORGE F. TAUBENECK

Learn to live and laugh — thus delay your epitaph

Stories of the Week

Mama Skunk was worried because she could never keep track of her children. They were oddly named "In" and "Out."

Whenever "In" was in, "Out" was out; she found out.

One day she called "Out" in and told him to go bring "In" in to her. So "Out" went out and brought "In" in.

"Wonderful!" said Mama Skunk. "How could you find him in so short a time?"

"It was easy," said Out. "In stinct."

In Central America a pair of revolutionists plotted to assassinate their dictator. Every morning at ten, they knew, this man took a bodyguarded stroll down a certain lane in a park. They hid themselves in a tree overlooking this path.

Unaccountably he didn't appear. Three days running they were ready for Freddie, but Freddie didn't show.

Muttered a plotter: "I hope nothing's happened to him."

Gags of the Week

The real difference between a beautiful woman and a charming woman: A beautiful woman you notice, while a charming woman notices you.

The longest odds in the world are those against getting even. —*El Mustang.*

Man Who Keeps His Word

Not too many years ago a man who shall be named in a moment told "Dope" that he intended to spend the best years of his life serving his country. News:

John Hertzler, retired vice president in charge of sales for York Corp., is a Republican candidate for Congress in the 19th Pennsylvania district. So, you see, he is a man of his word. And we admire him for it.

Defining himself as an "Eisenhower Republican," Hertzler writes that our President's residency at Gettysburg, Pa., was "an important consideration" in his decision to run for Congress at this time.

(Concluded on Page 18, Col. 1)

Historical Lesson for Air Conditioning Promoters

Analyzing the development of our industry, a leading manufacturer once made the statement that the refrigeration industry was built at the expense of stockholders.

"Who paid the cost of pioneering in the automobile industry?" he queried, rhetorically. "Why, the public, of course. Who generally pays the cost of pioneering any new product? The public. Who should pay the pioneering charge? The public—because the public gets the benefit of it. But who paid for pioneering electric refrigeration?" he perorated. "Stockholders! The number of corporations which have gone broke in this business is shameful!"

After interviewing veterans of our industry, and thumbing through bound volumes of back numbers of THE NEWS, it's easy to agree with the executive quoted above. The number of manufacturers who have entered the air conditioning and refrigeration industry with high hopes and a bagful of stockholders' money—only to fall with a

(Concluded on Page 46)

Air Conditioning 'Showcase'

This is the "Air Conditioning Showcase" issue. It is one which after a first reading, you will want to place in a handy spot to refer to throughout the year.

In the separate second section are published Specifications of 1956 models of self-contained room air conditioners, commercial packaged units, and complete home residential air conditioners.

Throughout the first section, in what is probably the greatest concentration of air conditioning advertising to appear in any publication, manufacturers of unit air conditioning equipment and components present details about the special features of, and promotion plans for, their 1956 lines.

Editorial features in this issue may help solve almost any kind of a problem the man in the field may encounter. Here are some of the articles (with page number following):

"New Twists to Installing Year-Round Systems" (26); "TV Station Solves Transmitter Cooling Problem" (23); "The Opportunity Now in Room Conditioners" (24); "Selling Preventive Maintenance" (36); "Thirty Packaged Units Cool 9-Story Bldg." (38); "Flexible Ice Storage System Saves Costs" (39); "Direct Testimony on Conditioning Benefits" (44); "How Water Savers Solved Water Shortage Problem" (52); "Short Course in Air Conditioning Fundamentals" (56); "Selling Residential Systems" (58); "How Residential System Controls Function" (60); "Balancing Ducts" (62); "Tips To Avoid Home Conditioning Pitfalls" (70); "What's the Market for Large Systems" (74); "How Much—and What Type—of Home Air Conditioning Systems Were Installed in Memphis in 1955" (10); "Chain Stores Consider Air Conditioning A Must" (16); "How Contractor Holds His Key Men" (19); "Drugstore Air Conditioning Benefits" (20).

What Will the Weather Be This Summer?

NEW YORK CITY—Following is the April-through-August long-range forecast as prepared especially for readers of AIR CONDITIONING & REFRIGERATION NEWS by Weather Trends, Inc., including explanation of the accompanying map.

"The seasonable weather outlook from June through August, 1956, as related to air conditioner sales, is more favorable than normal in the Mississippi Valley and southern states and less favorable throughout most of the northern states.

"A brief review of April's weather pattern indicates that warm and humid conditions will prevail over the southeast quadrant of the country and preseasonal demand should be relatively heavy in this region. Last April, temperatures were above normal in all sections of the country, east of the Rocky

(Concluded on Page 94, Col. 3)

Wampler Chairman, Bynum President At Carrier Corp.

NEW YORK CITY — At a meeting of the board of directors of Carrier Corp. held here recently, Cloud Wampler was elected chairman of the board and in that capacity will continue as the chief executive officer. William Bynum, executive vice president since 1951, was elected president to succeed Wampler and will be in charge of operations.

In 1941 Wampler, who is now 60 years of age, left the investment banking firm which bore his name to become executive vice president of Carrier. Prior to that he had served for six years as a director and a member of the executive committee, of which he is now chairman. He was elected president in 1942 and has been both chairman and president since 1952.

In the 14 years that Wampler has been full-time with Carrier,

(Concluded on Page 94, Col. 1)

Mitchell Has 2 New Residential, 5 Room Models

CHICAGO—Mitchell Mfg. Co. has just introduced several new models—two remote residential air conditioners—a 2-hp. unit with a suggested list price of $632.50 and a 3-hp. unit priced at $823.50; a 7½-amp. plug-in, ¾-hp. room air conditioner; ¾ and 1-hp. air conditioners "embodying a new 'pancake' design principle"; and ¾ and 1-hp. casement window air conditioners.

The company also announced a new advertising service for package air conditioner contrac-

(Concluded on Page 93, Col. 1)

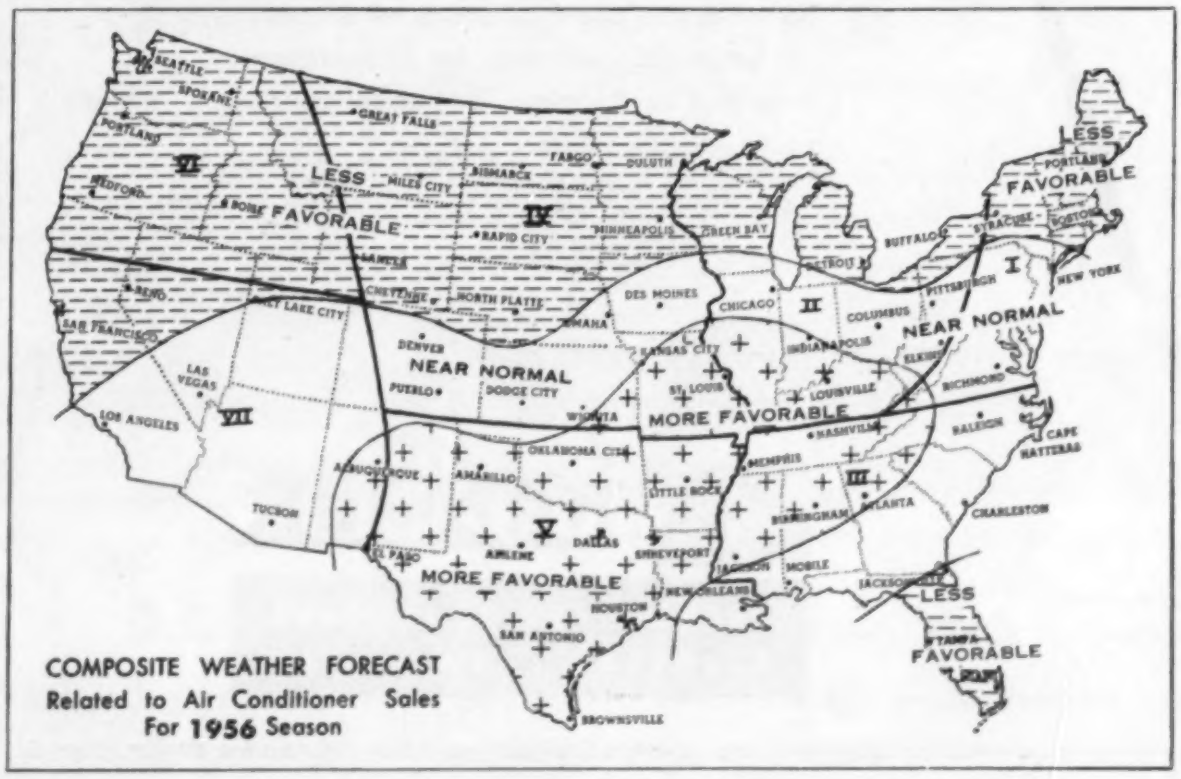
'55 Home Unit Sales Up 34% In N. Y. Area

NEW YORK CITY—Sales of air conditioning in New York City and Westchester County last year were 34% higher than in 1954, Consolidated Edison figures show.

Based on data received from manufacturers or their local representatives, there were 164,982 sales of air conditioning in the area during 1955, with a total of 242,555 hp. including auxiliaries.

A breakdown of sales by type of system shows that 155,341 room coolers, with a total of 118,202 hp., were sold during

(Concluded on Page 6, Col. 3)



COMPOSITE WEATHER FORECAST
Related to Air Conditioner Sales For 1956 Season

Fewer Makes This Year

DETROIT — Compiled in the second section of this issue are specifications on 1956 models of self-contained room and commercial air conditioners and complete residential systems as gathered from 104 manufacturers. An index appears on the first page of the second section.

Though the number of manufacturers listed are five fewer than last year, the number of lines of residential units remains the same and the number of commercial lines has decreased by only one. However, there are 16 fewer manufacturers of room air conditioners than last year, continuing a shrinking trend started in 1953.

Airtemp Promotes Davidson In Sales

DAYTON — Airtemp Div., Chrysler Corp. has announced the promotion of J. C. (Jack) Davidson to the post of assistant sales manager—residential heating and cooling.

J. C. Davidson

J. F. Knoff, vice president in charge of sales, stated that the post has been newly created in line with the company's enlarged program.

Manager of Airtemp's application-engineering department for the past two years, Davidson has been associated with the division since 1947. Prior to joining the company, he was heating and air conditioning engineer for the Minneapolis Building Inspection Department.

Westinghouse Keys Home Unit Promotion To Competitive Prices

DETROIT—New low prices that are claimed to be competitive with any in the field will be a key promotion point in the "Operation Volume" sales drive on Westinghouse residential air conditioning units in 1956.

This was brought out at a recent meeting of Temp-Matic Distributors here, eastern Michigan distributor for Westinghouse air conditioning products. T. H. Mabley, general manager of the Michigan firm, described the "Operation Volume" program.

The new Staunton, Va. plant in which Westinghouse residential and air conditioning products are produced has not been affected by the strike, declared J. R. Reynolds, Westinghouse division manager. He described the developments leading up to the new "RO" and "RG" year-round residential models.

"Star Salesman" Betty Furness was introduced at the meeting through the medium of a sound film. Representatives from Chicago, Cleveland, and Detroit participated in the program with talks on commercial units, service, and plans for increased advertising effort.

Ellington AFB Seeks Air Conditioning To Aid Class Training

ELLINGTON AIR FORCE BASE, Texas—The Air Force has been seeking to have air conditioning installed in 30 classroom buildings in this air base near Houston.

The project is working its way through the steps of government, from Congressional approval to appropriation to construction.

The buildings aggregate 88,-150 sq. ft.

Col. F. J. Rodenhauser of the Air Force told the Senate last summer, "Air conditioning the buildings would enable us to get several times as much training into the students as without.

"Their ability to concentrate and take instruction is directly proportional to the students' physical comfort."

The air conditioning proposal was included in a $1,072,000 proposition for an appropriation for Ellington which also included money for strengthening the runways. No breakdown was given of how how much is for air conditioning.

Ala. City Hall To Be Cooled

ADAMSVILLE, Ala.—According to Mayor L. S. Shiflett, a new city hall building to be erected here will be air conditioned.

To cost about $55,000, it will include council chambers for the city council, a courtroom, and offices for city hall workers.

Texas Firm Incorporate

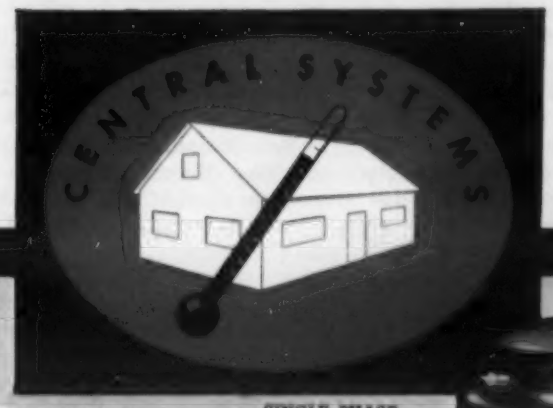
AUSTIN, Texas — Nalley-Weatherby Air Conditioning Co. has recently been incorporated in Dallas, records in the Secretary of State's office here show.

Capital stock of the company was listed as 600 shares at $25 a share.

For more information about products advertised on this page use Information Center, page 66.

Tecumseh COMPRESSORS

encompass EVERY refrigeration application!



OVER 50% OF THE CENTRAL SYSTEMS USE Tecumseh COMPRESSORS

HERE'S WHY—Tecumseh has everything the year-around air conditioning manufacturer wants in a hermetic compressor designed for his application. The economy, flexibility and scope of these 7 basic models cover numerous variations to pinpoint the compressor to the application. Tecumseh customers are assured of the ideal compressor for split or zone systems, add-on or package units and remote installations.

Incorporating features vitally important to year-around air conditioning, Tecumseh offers a horsepower range from 1½ to 5 H.P., with BTU ratings from 16,500 to 62,500. In the 1½ and 2 H.P. group, customers have a choice of internal or external mount compressors. Model B74T16 is an economy 2 H.P. for air cooled applications which do not require full 2 H.P. capacity.

The 2 and 3 H.P. internal mount compressors are available in single or three phase, for either air or water cooled applications. Models JB200 and JE300 are charged with F-22 and model JE200 with F-12. Optional equipment provides an oil sight glass to quickly check the oil level and flange valves for easy compressor exchange.

All of the latest compressor advancements included in the integral line are incorporated into the externally mounted 5 H.P. compressor. Single or three phase models are available as well as flange valves and oil sight glasses. Designed for high back pressure only, this model is charged with Freon 22.

Tecumseh Hermetic Air Conditioning Compressors have been designed for the toughest conditions associated with this application. In 90° ambient with a 45° coil they will deliver full rated capacity. Further, they will operate properly in 120° ambient and continue to cool even on 90% of rated voltage.

Apply the advantages of the only complete line of compressors designed expressly for air conditioning. For detailed information and specifications write your nearest Tecumseh District Office today.

Model B32P16
1½ H.P.—16,500 BTU

Model B74T16
2 H.P.—19,500 BTU

Model JB150
1½ H.P.—16,400 BTU

THREE PHASE
Model FB500
5 H.P.—62,500 BTU

SINGLE PHASE
Model FB500
5 H.P.—62,500 BTU

SINGLE PHASE
Models
JB200—2 H.P.—24,000 BTU
JE200—2 H.P.—22,500 BTU
JE300—3 H.P.—35,000 BTU

THREE PHASE
Models
JB200—2 H.P.—24,000 BTU
JE200—2 H.P.—22,500 BTU
JE300—3 H.P.—35,000 BTU

SINGLE PHASE
Models
JB200—2 H.P.—24,000 BTU
JE300—3 H.P.—35,000 BTU

COMPLETE LINES – VOLUME PRODUCTION – PRICED RIGHT

OVER 22,000,000 COMPRESSORS IN USE TODAY

The World's Largest Producer of Compressors for the Refrigeration Industry

TECUMSEH PRODUCTS CO. | Tecumseh, Michigan
Marion, Ohio

EXPORT DEPT. - P.O. Box 2280, 24530 Michigan Ave., W. Dearborn, Michigan

For more information about products advertised on this page use Information Center, page 66.

RACCA-Pipe Fitters Affirm Bargaining Agreement Again

MIAMI, Fla.—A re-affirmation of the agreement whereby the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry recognizes the Refrigeration and Air Conditioning Contractors Association as a bona fide organization of contractors with which its local unions will bargain, was made at a Joint Committee meeting here.

The agreement, originally set up in 1948, further recognizes local RACCA groups as employer bargaining agents for wages and working conditions for refrigeration and air conditioning contracts in the areas in which they operate.

At the Miami meeting a subcommittee was named to develop some activities on a local and national scale, in which the union and the contractor groups may participate.

The apprentice training program is one of these, it was reported.

RACCA committee members at the Miami meeting included Dudley Cawthon, Miami; William Moody, Houston; Harvey Miller, Chicago; Harvey Hottel, Washington; Paul Hughes, Jersey City; Ray Bennis, New York City; and Ray Kromer, executive secretary of RACCA.

The United Association representatives included Peter T. Schoemann, general president; John J. McCartin, assistant general president; Joseph F. McCartin, assistant general president; and Joseph F. Monaghan, all from the UA office in Washington, D. C.; Leo A. Green, vice president, Pittsburgh; R. J. Picard, Los Angeles; and Wendell J. Straight, Seattle.

New FHA Procedures Expected To Boost Home Unit Growth

DALLAS — New operating procedures by the Veterans and Federal Housing Administrations are going to increase the growth of residential air conditioning, already a billion dollar a year industry, Ned A. Cole, project manager of the Austin (Texas) air conditioned village, declared here recently.

"Largely upon research produced at the air conditioned village, most VA and FHA offices no longer will add an extra amount for operating air conditioning in computing salary requirements for mortgages," he told a seminar of the educational foundation of the Dallas Real Estate Board.

Cole contended that operating air conditioning equipment is not as expensive "as people say."

"Often other increased electrical uses are counted in the total bill, and the extra amount usually is attributed only to air conditioning," he declared.

"If this doesn't explain the alleged extra costs, then a check should be made for malfunctioning of the equipment or faulty installation."

Cole declared that the average yearly bill for operating air conditioning in 22 residences at the village was $111.93, an average of $9.20 a month. The highest monthly bill was $24.

Showroom Being Built

GLENDALE, Calif. — Construction has begun on General Controls Co.'s new building at Bryant and 4th in San Francisco. This new 5,000-sq. ft. structure will serve as showroom, sales office and warehouse for General Controls' San Francisco branch.

Many Subjects Covered At First RSES Forum In San Antonio, Mar. 2-4

SAN ANTONIO—First in the new series of educational forums sponsored by the Refrigeration Service Engineers Society drew good attendance at the Gunter hotel here March 2 to 4.

There were no manufacturers' exhibits in connection with this conference, but Air-Conditioning and Refrigeration Institute is providing financial support for this series of four RSES conferences.

Remaining three conferences are scheduled for Boston in September, Kansas City, Mo. in November, and San Francisco in March, 1957, announced John H. Spence, RSES educational chairman.

Detailed reports of the educational talks presented at the San Antonio forum will appear in future issues of AIR CONDITIONING & REFRIGERATION NEWS.

Also cooperating in the forums is the Air Conditioning and Refrigeration Wholesalers association. Region 8 of ARW held a meeting here during the conference with 41 wholesalers present.

Host for the forum, which also represented the sixth annual Southwestern Regional RSES conference was the San Antonio chapter.

Wide variety of subjects was covered in the series of 10 educational talks and demonstrations plus three films and a guided tour through the plant of Friedrich Refrigerators, Inc., which had been lined up by Paul B. Reed, RSES educational director.

Ductwork, gas heating, automobile air conditioning, water treatment, moisture, duct insulation, and field replacement of components plus Information Please sessions were among the topics of discussion during the conference.

Top honors in a "gadget" contest held in conjunction with the conference were taken by Henry A. Pfiefer of Fredericksburg, Texas, who won the $50 first prize. Second prize of $25 went to Wilson J. Malcik of Temple, Texas; third prize of $15 to Ted Gawron of San Antonio; fourth prize of $10 to E. B. Van Hoeson of Wharton, Texas.

General chairman of the convention committee was P. K. Crawford with C. C. Brinkoeter as co-chairman.

Parts wholesalers served on a general committee headed by Jack Friesen.

ARI was officially represented at the forum by George Jones, Jr., managing director, and ARW by E. L. Tramposh, president.

In the election of new officers for the Southwestern Regional RSES group, Max Quattlebaum of Fort Worth was chosen president; Robert Duke of San Antonio, vice president; G. H. Christmas of Houston, secretary; Jos. I. Reed of Dallas, treasurer; and Ralph Wright of Fort Worth, new sergeant-at-arms.

The group expects to hold its 1957 meeting in Fort Worth, it was announced.

For more information about products advertised on this page use Information Center, page 66.

'Beginners', 'Advanced' Sessions Highlight Air Conditioning Conference Mar. 22-23

COLUMBIA, Mo. — Program for the University of Missouri's third annual air conditioning conference, to be held March 22-23 at the Memorial Student Union, was announced recently.

The conference is for air conditioning dealers and sales personnel; architects, contractors, and engineers who specify air conditioning; air conditioning servicemen, and users.

Registration Required By March 17

Advance registration is required by March 17. The registration fee is $10, which includes the cost of two meals. Checks are to be made payable to the University of Missouri.

Hotel reservations may be made by writing the Tiger hotel or the Daniel Boone hotel here.

Further information on the conference may be obtained from Prof. M. M. Bolstad, Mechanical Engineering Dept., University of Missouri, or the university's Adult Education and Extension Service.

This year, part of the conference will consist of concurrent sessions for both "beginners" and "advanced" men in the field.

Opening Session at 9:30 a. m., March 22

Opening session of the conference will start at 9:30 a.m. on Thursday, March 22, with Ralph Scorah, chairman of the university's Mechanical Engineering Dept., as chairman. At this session, Dr. W. S. Platner, professor of physiology, School of Medicine, University of Missouri, will speak on "Air Conditioning for Human Comfort."

In the afternoon, Dr. Frank B. Engley, Jr., professor and chairman, Dept. of Microbiology, School of Medicine, University of Missouri, will discuss "Air Borne Disease and Its Control."

There will also be a panel discussion on "Air Purity and Cleaning." Speakers will be C. H. Cheyney, C. H. Burnap Co., St. Louis, who will talk on "Dry, Viscous, and Electronic Dust Filters," and H. L. Barnebey, Barnebey-Cheney Co., Columbus, Ohio, whose topic will be "Odor Removal In Air Conditioned Space."

Allen Baker, Baker-McClintic Co., Columbia, Mo., will serve as chairman of this session.

A dinner meeting is scheduled for Thursday evening. The speaker, Marshall Fryer, product director of air conditioning equipment, The Coleman Co., will talk on "A New Gas-Powered Air Conditioning Unit."

For Friday sessions, two sections meet concurrently.

John Levenhagen, assistant branch manager, Johnson Service Co., St. Louis, will be chairman for the Section 1 session on Friday morning. This section will hear a talk on "Air Conditioning Load Analysis" by a speaker to be announced later, and a discussion of "The Proper Use of Grilles and Diffusers" by Henry C. Sharp, H. C. Sharp Co., St. Louis.

Meeting at the same time, Section 2 conferees will be addressed by J. A. Mulcahey, The Bush Mfg. Co., and W. R. Musser, chemical engineer, Micromet Div., Calgon, Inc.

Mulcahey will talk on "The Use of Highly Efficient Heat Transfer Surfaces In Air Conditioning Equipment." Musser's subject will be "Scale and Corrosion in Air Conditioning Equipment." F. Edward Ince, Marlo Coil Co., will be the chairman.

Following lunch, Donald P. Herman, Smith-Hanlon-Zurheide-Levy, Inc., St. Louis consulting engineer, will speak on "Duct Design." Chairman of this session will be Kenneth Zenge, Philips & Co., Columbia, Mo.

The Section 2 group will hear a talk on "Noise Problems In Air Conditioning Equipment" by C. W. Schumacher, General Heating & Cooling Co., Kansas City, Mo.

The combined sections then will hear Robert G. Yeck, agricultural engineer, U. S. Department of Agriculture, Columbia, Mo., discuss "A Possible Future Feld for Air Conditioning—Animal Shelters."

Air Conditioning, Refrigeration Degree Offered by Houston U

HOUSTON, Texas—The University of Houston offers a degree in air conditioning and refrigeration.

Graduates of the university's department of Air Conditioning and Refrigeration get a degree of bachelor of applied science.

The university also offers to engineering students a combination of their major field of study with a two-year course in air conditioning and refrigeration.

Arkansas Hospital To Be Fully Air Conditioned

PARAGOULD, Ark. — Three of Community hospital's five floors will be completely air conditioned this summer, it was reported here recently.

Plans have been approved for the second phase of the hospital's air conditioning program. As a result, the first, second, and third floors will be completed.

Surgical suites on the top floor are already fully air conditioned, the report continued. The remaining floor is the basement.

164,982 Units of All Types Sold In 1955

— 1955 —

Type System	Number	Equiv. Hp.	Electric Horsepower Compressors	Auxiliaries	Total Hp.
Room Coolers	155,341	....	....	....	118,202
Residential System .	1,217	....	4,001	435	4,436
Store Coolers	7,464	....	44,861	8,386	53,247
Small Central	809	....	10,967	4,223	15,190
Large Central	126	....	13,360	6,413	19,773
Turbine	13	16,179	....	11,310	27,489
Absorption	12	2,475	....	1,743	4,218
Totals	**164,982**	**18,654**	**73,189**	**32,510**	**242,555**

122,621 Units of All Types Sold In 1954

— 1954 —

Type System	Number	Equiv. Hp.	Electric Horsepower Compressors	Auxiliaries	Total Hp.
Room Coolers	113,997	....	....	....	86,620
Residential System .	977	....	3,147	372	3,519
Store Coolers	6,848	....	38,162	6,864	45,026
Small Central	660	....	12,407	4,765	17,172
Large Central	112	....	14,935	7,157	22,082
Turbine	10	14,341	....	10,045	24,386
Absorption	17	2,962	....	1,985	4,947
Totals	**122,621**	**17,303**	**68,641**	**31,188**	**203,752**

New York City Area Sales--

(Concluded from Page 1)

1955, against 113,997, with a total of 86,620 hp., in the previous year—a gain of 36%.

The 1955 figure includes 2,671 units with a ⅓-hp. compressor motor, 45,346 of the ½-hp. type, and 87,789 with a ¾-hp. motor. There were also 16,052 units of the 1-hp. size while the balance, or 3,483, were in the 1½ and 2-hp. groups.

The 113,997 room coolers sold in 1954 included 3,037 units with a ⅓-hp. compressor motor, 36,164 of the ½-hp. type, and 61,161 with a ¾-hp. motor. In addition, there were 11,222 units of the 1-hp. size and 1,413 in the 1½ and 2-hp. groups.

Home Systems Sales Rose 24% over '54

Sales of electric residential air conditioning systems in the area during 1955 rose 24% over 1954, totaling 1,217 compared with 977. (In listing the latter figure, the report noted that absorption systems are included in the central systems group).

3-Hp. Compressor Used In 568 Systems

Regarding the residential systems sold in 1955, the Consolidated Edison report noted that the compressors and auxiliaries totaled 4,436 hp. Fifty-six of these systems were 1.5 hp. or less, 272 used 2-hp. compressors, one was of 2.5-hp. size, 568 were of the 3-hp. size, and 286 were in the 5-hp. group, while 34 units were of 7.5 hp.

In 1954, residential-system compressors and auxiliaries totaled 3,519 hp. A total of 286 of the systems used 2-hp. compressors, 483 were of the 3-hp. size, and 181 were in the 5-hp. group. There were also 20 units of 7.5 hp. while the remaining seven units fell in the 6 and 15-hp. sizes.

7,464 Store Coolers Sold In '55

There were 7,464 store coolers of 53,247 hp. including auxiliaries sold last year in the area. In this group were included those ranging from 2 to 25 compressor horsepower.

Of the coolers sold, 2,216 were of 3 hp. and 2,695 in the 5-hp. group. There were also 950 of 7.5 hp. and 559 with 10-hp. compressors, 573 of 15 hp., and 124 with 20, 25, or 30-hp. compressors. The balance, or 347, were of 2 hp.

During 1954, 6,848 store coolers with a total horsepower of 45,026 including auxiliaries were sold. Of this total, 2,008 were of 3 hp., 2,804 in the 5-hp. group, 893 of 7.5 hp., 495 with 10-hp. compressors, 376 of 15 hp., and 10 with 20 or 25-hp. compressors. The rest, 262, were of 2 hp.

935 Purchase Central Systems

Sales of central systems of all electric air conditioning in 1955 were reported as 935 with a total of 34,963 hp. This compares with 772 such central systems with a total of 39,254 hp. sold during the previous year.

The 1955 sales figure includes 809 installations under 50 tons capacity with a total of 15,190 hp. including auxiliaries, and 126 installations of 50 tons or over with a connected load of 19,773 hp.

In addition, sales were made of 16,179 turbine horsepower for 13 steam electric systems with 11,310 auxiliary horsepower. There were also 12 absorption systems with a total capacity of approximately 2,475 tons of refrigeration utilizing approximately 1,743 hp. in auxiliaries.

The 772 all electric central systems sold in 1954 included 660 installations under 50 tons capacity with a total of 17,172 hp. including auxiliaries, and 112 installations of 50 tons or over with a connected load of 22,082 hp.

Contracts were also signed in 1954 for 14,341 turbine horsepower for 10 steam electric systems with 10,045 auxiliary horsepower. In addition, there were 17 absorption systems with a total capacity of approximately 2,962 tons of refrigeration utilizing about 1,985 hp. in auxiliaries.

For more information about products advertised on this page use Information Center, page 66.

MITCHELL AUTOMATION!

complete selling program

MITCHELL *AUTOMATIC* DIRECT MAIL

MITCHELL AUTOMATION "BIRD-DOGS" QUALIFIED PROSPECTS AND CONVERTS THEM TO CUSTOMERS!

Aggressive direct mail programs, tested and proven for big profit results, are ready to go in the mail for you!

MITCHELL'S FOREIGN LETTER MAILING . . . prospects receive a unique series of three letters from foreign lands, each is *signed by you* and *sells for you* with vigorous impact!

MITCHELL'S SHOTGUN MAILING . . . a high powered selling story that blasts into your market using *complete saturation to headline you!*

MITCHELL *AUTOMATIC* LOCAL ADVERTISING

MITCHELL AUTOMATION FEATURES YOU IN YOUR MARKET! KEEPS LIVE LEADS COMING IN!

Professionally prepared newspaper ads, TV and radio spots will be placed for you by *Mitchell's* national advertising agency. Every detail is performed automatically . . . *that's Automation Advertising!*

Mitchell's hard-hitting television film is an automatic lead getter! *Mitchell* buys the time and ties in with a local telephone answering service to deliver live leads to your desk every morning.

MITCHELL *AUTOMATIC* HOME SELLING

MITCHELL AUTOMATION MAKES YOUR SALESMEN MORE EFFECTIVE CLOSERS!

MITCHELL'S PHOTOGRAPH MAILING . . . qualifies prospects and gives them an actual photograph of their home through the mail. *Mitchell Automation* makes the pictures . . . *You* make the sales!

MITCHELL'S HOME DEMONSTRATION BOOK is a complete guide for salesmen . . . a pre-packaged sales story on the entire line of Mitchell packaged air conditioners. This is a factual, down to earth presentation, graphically told in words and pictures, enabling *every* salesman to close an order in one call at the customer's home.

MITCHELL MANUFACTURING COMPANY *A DIVISION OF CORY CORPORATION*

IN CANADA • 19 Waterman Ave., Toronto • IN MEXICO • Mitchell-American,

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the first self operating, is ready now for you!

MITCHELL *Push Button Selling* BUILDS YOUR PRESTIGE AS IT BUILDS YOUR BUSINESS!

Personalized
REPUTATION BUILDER FOLDERS

. . . are tailor made to tell *your* story! These beautifully printed, two color brochures build *you* as *the* air conditioning specialist in your territory!

Personalized
METAL NAME PLATES

. . . put your name, address, phone number and selling message on every unit you install to make sure you get and keep that profitable service, repair and replacement business!

Personalized
BUILDER PROMOTION

. . . gives your builder clients beautifully designed, personalized brochures, individually prepared to sell *their* homes that have been air conditioned with *your Mitchell units*. This *Automation Extra* is a big, two way business builder.

Personalized
MITCHELL AIR CONDITIONING PROPOSAL

. . . is designed to protect you and insure greater customer satisfaction. It gives you simplified, easy to understand, commercial and residential contract forms and a new, business-like proposal.

***HG Series* MITCHELL YEAR ROUND AIR CONDITIONER**

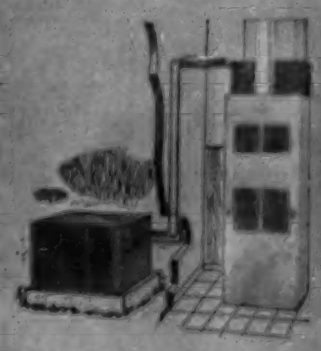
Cools in summer . . . heats in winter. Water cooled air conditioner . . . gas fired furnace. Advance design cooling system available in 1½, 2 and 3 tons.

***S Series* MITCHELL SELF CONTAINED STORE COOLER UNIT**

Features Slide-out Chassis. Welded hermetic cooling system. Electromagic Filter Eye. Low operating cost, easy installation. Available in air and water cooled models.

***C Series* MITCHELL RESIDENTIAL ADD-ON AIR CONDITIONER**

Powerful hermetic cooling system for use with or without matching blower. Available in both air and water cooled models . . . 2, 3 and 5 tons.



***RA Series* MITCHELL REMOTE AIR CONDITIONER**

New lost cost, waterless air conditioner cools entire home. Uses same blower and ducts as heating system, fits most warm air furnaces. U. L. Approved for outdoor location of condensing unit. Available in 2, 3 and 5 tons.

***QR Series* MITCHELL MULTI-ROOM, AIR COOLED RESIDENTIAL PACKAGE**

New, low cost air cooled air conditioning for average homes or zone cooling of larger homes. Takes no living space. High power factor corrected. Available in 2 tons.

***TEST** the muscle of this hefty Mitchell promotion and feel the enormous power that sets you up for your biggest year yet in air conditioning!*

MAIL THIS COUPON TODAY!

2525 N. CLYBOURN AVE., CHICAGO 14, ILL.
78 Orinoco, Gral. Anaya Mex. D.F.

MITCHELL MANUFACTURING COMPANY
AC-5 2525 N. Clybourn Ave., Chicago 14, Ill.

Gentlemen,
We want to put MITCHELL AUTOMATION ADVERTISING to work for us. Please send complete details right away.

Name_____

Store name_____

Address_____

City_____ Zone_____ State_____

For more information about products advertised on this page use Information Center, page 66.

What Happened To Residential Air Conditioning In '55:

The accompanying study of residential air conditioning sales in Memphis during 1955 is a part of a continuing survey by AIR CONDITIONING & REFRIGERATION NEWS *of this rapidly growing segment of the industry. Because C. Dale Mericle reported on statistics gathered from these same communities in 1954 growth and trends in the market are also revealed.*

1954 sales figures for Wichita, Kan., Fort Worth, Texas, Memphis, Minneapolis, Cincinnati, Wilmington, Del., and Atlanta were included in the original series which ran during the latter months of 1954 and 1955.

To date the 1955 reports cover Wichita, Cincinnati, and this current report on Memphis.

By C. Dale Mericle

MEMPHIS — Despite a disappointing cool summer last year, Memphis contractors and distributors more than doubled sales of residential air conditioning over 1954.

A total of 1,251 residential units were installed in Memphis during 1955, it was determined by AIR CONDITIONING & REFRIGERATION NEWS in a survey here. The 1954 total was 532.

(A somewhat similar survey made chiefly by checking Memphis city installation permits showed 344 installations in the first nine months of 1954. This was described in the Nov. 29, 1954, issue of the NEWS.)

Data on number of 1955 installations was obtained from 16 contractors and six distributors. Actual number of contractors involved is difficult to determine. The six distributors indicated a total of 50 to 60 installers between them, but there may be overlapping here.

Two of the distributors are also active in contracting.

Results of the 1955 survey are given in the accompanying tabulation, which shows how the various contractors and distributors shared the sales, type of buyer, type of equipment, and whether or not the contractor has his own sheet metal shop.

Speculative Home Builder Becoming Bigger Factor

Some significant conclusions are immediately apparent in the Memphis survey:

(1) Although "existing" homes still provide the bulk of the market for residential air conditioning, the speculative home builder is becoming an increasingly important factor.

(2) Air-cooled units are now employed in the majority of home installations.

(3) Majority of units are those of air conditioning manufacturers, not "furnace" companies.

(4) No definite distribution pattern has yet emerged at the retail level.

51% Go Into Existing Homes

The accompanying table shows that 634 or 51% of the jobs went into existing homes during 1955. In the previous survey covering nine months of 1954, existing homes accounted for 60% of the installations.

Biggest gain has been made in the speculative builder classification. The 1955 survey reveals that 335 installations were made in new homes at the choice of the builder, representing 27% of the total. This is in sharp contrast to the mere eight jobs or 2% of the 1954 nine-month total.

New homes where air conditioning was installed at the option of the buyer or shortly after he had occupied the dwelling, accounted for 282 sales, or 22%. This group had represented 38% of the 1954 installations.

An attempt is also made in the table to show a comparison between installations of year-round systems and the addition of cooling only. It should be pointed out that "year-round" systems, as the term is employed here, means the installation of both cooling and heating units at the same time. Separate cabinets may or may not be employed, and the make of the cooling unit can be different from the heating plant.

Likewise, the term "cooling only" includes "add-on" units as well as completely self-contained residential cooling units.

In 1955 there were 617 year-round systems installed in the Memphis area and 634 "cooling only" jobs. Eleven heat pumps are in the year-round listing.

(Attempts to differentiate between these two types of installations in the 1954 survey were unsuccessful, so no comparison between 1955 and 1954 on this score is possible.)

More Air-Cooled Jobs

As for air vs. water-cooled systems, the 1955 survey shows 742 air-cooled jobs and 509 water-cooled installations (59% vs. 41%, respectively).

In 1954 there were 84 air-cooled installations out of 344, representing 24% of the 344 total for nine months.

Contractors and distributors generally expect an even greater percentage of installations to go air cooled in the future, they indicate.

Virtually all of the water-cooled systems (500 out of 509) were equipped with cooling towers or evaporative condensers. There were 111 evaporative condensers and 389 towers installed for the Memphis residential jobs last year.

22 Different Makes

Twenty-two different makes are represented in the 1955 total of 1,251 residential units in Memphis. Sixteen makes represent either old-line air conditioning and refrigeration manufacturers or newer firms who came into the central residential picture via window units. These 16 makes garnered a total of 968 jobs between them, or 77% of the total.

"Furnace" manufacturers are represented by six different makes whose combined installations totaled 283 jobs, or 23%, it was found. Counted in the

(Concluded on next page)

For more information about products advertised on this page use Information Center, page 66.

Memphis Installs 1,251 Units to More Than Double '54 Despite Cool Summer

(Concluded from preceding page)

"furnace" group are two makes now actually owned by old-line air conditioning and refrigeration manufacturers.

Three makes well known in the air conditioning industry dominated the Memphis residential picture in 1955. Between them, these three had a total of 674 jobs, representing 54% of the 1,251 installations.

One of these three had 26% of the total; the second, 16%; the third, 12%.

As for the actual selling and installing of residential air conditioning, no clear-cut picture has yet developed in Memphis. An analysis of the 1955 installations indicates that approximately half of the units were sold and/or installed by air conditioning and refrigeration contractors while half went to heating and plumbing firms.

Biggest contractors, in terms of units, were air conditioning firms. Most of these, however, also do heating, although air conditioning came first.

Most Contractors Have Own Sheet Metal Shop

It will be noted in the accompanying table that nine of the 16 individual contractors listed operate their own sheet metal shops while seven do not. The two distributors who also do contracting have their own sheet metal shops, too. It was impossible to obtain any data on this point about the 50 to 60 dealers served by the six distributors.

Perhaps only one positive conclusion regarding retail distribution of residential air conditioning in Memphis can be reached on the basis of this survey:

Those who predicted two or three years ago that the heating and sheet metal contractor would "walk away" with the residential air conditioning business have yet to be proved right in Memphis.

Residential air conditioning in Memphis is being installed on a one-year free service basis plus the additional four-year factory warranty on components as provided by the manufacturer.

Questioned about service problems encountered on residential jobs, most Memphis contractors reported little out of the ordinary:

"Mostly electrical."

"Bad condenser scaling on water cooled. Nothing in particular on air cooled."

"Low voltage. Condensing water problem. Dirty filters, etc. Customer expects too much out of unit."

Customer Education Lacking on Many Jobs

"Each customer has to be educated to proper operation for his particular requirements. Many installations on new small homes in particular do not have qualified engineering and installation, and the owner does not get qualified service and warranty."

"Balancing of systems, usually on existing ductwork jobs. Sensitivity of electrical control system. Although this latter is meant for the protection of purchaser and equipment, it is extremely vexing in some installations due to its complexity until the installation is finally made 100% satisfactory. Fine growing market, especially existing homes, and it will stabilize when the Johnny-Come-Lately's settle down either in or out of the picture."

Dallas Distributor Names Booth General Sales Manager

DALLAS — Jim Booth has been appointed general sales manager of the Adleta Co., Dallas wholesale distributor of RCA, RCA Victor, RCA Whirlpool, and allied products.

Booth succeeds E. P. Miles who recently was elevated to general manager.

Residential Air Conditioning In Memphis In 1955

Contractor	1954	1955	—New Homes— Owner	Builder	Existing Homes	Year-Round	Cooling Only	Air Cooled	Water Cooled	With Tower	Sheet Metal Shop
1	130	195	23	8	164	64	131	174	21	13	Yes
2	102	95	22	12	61	30	65	18	77	77	Yes
3	3	57	....	42	15	43	14	....	57	57	No
4	35	56	34	12	10	34*	22	20	36	36	Yes
5	10	48	32	12	4	10	38	43	5	5	Yes
6	....	45	2	....	43	2	43	4	41	41†	Yes
7	18	33	14	11	8	25	8	33	....	....	No
8	15	25	4	3	18	16	9	13	12	12	Yes
9	3	20	8	....	12	8	12	4	16	16	No
10	2	15	6	6	3	12	3	12	3	3	Yes
11	1	12	....	12	....	12	....	12	....	....	Yes
12	....	9	....	6	3	6	3	9	....	....	No
13	1	8	5	....	3	5	3	2	6	6	No
14	....	6	4	....	2	....	6	6	....	....	No
15	1	5	2	....	3	....	5	....	5	5	No
16	1	1	1	....	....	1	....	....	1	....	Yes
Distributor											
A	130	325	65	65	195	130	195	315	10	10	....
B	40	154	5	100	49	104	50	48	106	106	....
C	20	80	30	30	20	80	....	....	80	80‡	....
D	20	50	25	12	13	35	15	23	27	27	....
E	....	6	....	4	2	....	6	6	....	....	....
F	....	6	....	....	6	....	6	....	6	6	....
Total	532	1,251	282	335	634	617	634	742	509	500	....

*Includes 11 heat pumps. †Evaporative Condensers. ‡Includes 70 evaporative condensers.

Room Unit Market Opportunities

Are Vast Because: There Are Many Commercial Prospects, Average Income Families Buy Them, Discounters Haven't Stolen Market; And There Is Great Desire for Comfort

NEW ORLEANS—Relatively minor purchase of room air conditioners by homeowners to date may be due in large measure to failure of the average retailer to capitalize on the inherent sales features of the mechanical cooling units, air conditioning manufacturers were told here recently.

Only one home in 22 in metropolitan and urban areas of the nation owns such units, and nearly 90% of the 45 million non-rural households have no form of man-made cooling, except fans, du Pont Co. representatives told the room air conditioner section of the Air-Conditioning & Refrigeration Institute at its annual meeting.

"Those figures, developed from a nationwide survey conducted by du Pont several months ago, indicate a virtually untapped market for the air conditioning industry," declared William A. Bours III, assistant director of sales for du Pont Co.'s Kinetic Chemicals Div.

9 Out of 10 Report They Haven't Been Solicited

One of the most startling findings in the du Pont survey, Bours noted, was the fact that nine out of 10 people said they had never been personally approached by a salesman, or even by a dealer direct mail program, in an effort to whet their desire for a window air conditioner.

Yet, he added, more than 60% of the non-owners surveyed indicated they had "missed" air conditioning at one time or another and were pre-conditioned to its advantages to the extent that a personal sales effort on the dealer's part might have swung them into the owner circle.

Operating Demonstration Being Neglected

Although few dealers apparently are capitalizing on it, an operating demonstration of the room cooling units, either in the home or the dealer's store, was sited as one of the dealer's easiest and most convincing sales tools.

Other sales points which the survey indicated were being overlooked by most dealers included the high rate of enthusiasm and satisfaction among people already owning units, the many health and housekeeping advantages of such equipment over and above the cooling benefits, and the opportunity to "trade up" customers who already are "appliance conscious" through purchases of other heavy home equipment like refrigerators, freezers, and ranges.

Dozens of other facts on consumer attitudes toward existing equipment and suggestions for operating and design features that homeowners wanted in future air conditioning units were outlined by Bours and Donald C. McSorley, advertising manager of Kinetic Chemicals.

There are plenty of valuable tips for any dealer who is selling room air conditioners, the Kinetic Chemicals Div. of du Pont survey on ownership of room air conditioners revealed. They can be helpful to those who want to try to "plan" a sales or sales promotion program to boost their share of the growing room cooler volume.

Some Sales Tips That Came Out of Data

Following are some of the "sales tips" that came out of the data collected in the survey.

1. There are still plenty of prospects and sales potential in the "commercial" phase of the market.

If ownership of room air conditioners in homes is as low as the survey indicates, then even in the past two years the percentage sold to offices, stores, factories, etc., must be substantial. It would certainly seem unwise for any dealer to forget this part of the market.

2. Most of the sales to homes have not been to the wealthy, or even to the "above-average" income group:

Greatest percentage of ownership was in the $3,000-$7,000 group.

3. Discount houses haven't stolen the market at all.

Only a little over 5% of the homeowners owning an air conditioner said they purchased it from a discount house.

4. The dealer's own sales efforts, and creation of a reputation as a place to purchase air conditioners, may be more important than national promotion.

Of homeowners purchasing air conditioners, only 35% cited brand reputation as a factor, and only 8% said they saw the maker's ad.

5. There is plenty of buying intent ready to be tapped.

A significant 6% (or almost half again more than those who presently own units) of non-owning households expressed definite buying intentions. However, 92% of all non-owning households claimed they had never been exposed to a direct effort to sell them a room air conditioning unit.

6. People who own a lot of other appliances are prime prospects, and are easy to spot.

91% of air conditioner owners also owned a TV set. 22% of the owners of room air conditioners also own a food freezer; whereas only 10% of the non-owners owned a food freezer. 59% of the owners also owned an automatic washer. . . . 32% of non-owners owned an automatic washer.

7. Majority of purchasers are those living in modest homes.

More than 60% of the owners of air conditioners covered in th survey lived in homes valued under $15,000.

8. There is plenty of desire to have comfort cooling.

More than 60% of the non-owners surveyed indicated that they had definitely "missed" not having air conditioning at some time.

IN '56
BUY ALL MODELS
MITCHELL *the QUIET*

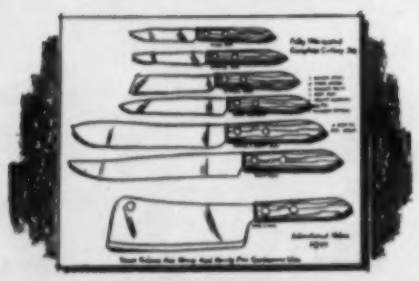
The Unbeaten Step-up Line...

Sell the world's finest room air conditioners
to every prospect, in his own price range.
Sell exclusive Mitchell features and quality!

with SHOUTING ADVERTISING

$1000.00-A-WEEK

Springtime New Dealer contest . . . Easiest sales-building plan ever conceived!



MEASURE-UP DIRECT MAIL CAMPAIGN

. . . and Premium Offer. Dealers draw traffic like a magnet with 7-piece knife set sales stimulator.

NATIONAL ADVERTISING

. . . packs the kick that makes Mitchell ads read and remembered; Mitchell Dealers harvest the sales!

MITCHELL MANUFACTURING COMPANY AC-4 *A DIVISION OF CORY CORPORATION*

For more information about products advertised on this page use Information Center, page 66.

For more information about products advertised on this page use Information Center, page 66.

Impartial Surveys Show

Chains Consider Conditioning a Merchandising Necessity, Retail Stores, Motels Offer Most Promising Sales Field

NEW YORK CITY—Small retail business establishments continue to offer one of the most promising fields for the sale of air conditioning, says Matthew M. Lawler, vice president of Worthington Corp.'s Air Conditioning and Refrigeration Div., and he points to impartial surveys made in various retail fields to back up his contention.

Small Stores Must Have Air Conditioning

"Customer demand for air conditioning has grown in recent years to the point where many small businesses cannot stay open without it," Lawler declares.

"Several trends in customer habits have removed air conditioning from the luxury to the necessity class for many small businessmen," Lawler said.

"As more and more office buildings are air conditioned, increasing thousands of persons demand the same comfort elsewhere. Housewives want the same comfortable conditions in their daily lives as enjoyed by their husbands in air conditioned offices.

Woman Shopper Expects Cool Comfort

"The woman shopper leaving the cool comfort of an air conditioned theater or restaurant is not going to want to spend much time in a hot, muggy shop. She is accustomed to—and expects—comfortable temperatures and humidity controls everywhere she shops."

Such factors leave the small businessman no choice, Lawler pointed out.

"Air conditioning is not something he ought to have. It's something he's got to have."

He cited a survey of 741 restaurants in 500 cities by *Restaurant Management* magazine which showed 67.3% of the better restaurants were air conditioned.

Steady Upward Trend Since '49 Shown

A comprehensive analysis of various types of retail stores prepared annually by *Chain Store Age* shows a steady upward trend from 1949 onward in the use of air conditioning. The survey included 1,179 companies operating a total of 24,840 stores last year.

"The significant thing," said Lawler, "is that an impartial magazine, with no axe to grind, had this to say: 'Many chains now accept air conditioning as a merchandising necessity.'"

Motels also are a promising market for the air conditioning industry.

Listing equipment essential to successful operation of a motel, *The American Motel Magazine* put air conditioning first on a long list. It said: "Air conditioning—a must, in individual units or through a central system."

Every one of the seven categories of retail stores included in the *Chain Store Age* survey showed an increase in expenditures for air conditioning except general merchandise department stores. These department stores, according to the magazine, "Spent about the same in 1955 as they did in 1954 for air conditioning—$4,500,000 in each year."

Other store investments in air conditioning ranged from soda fountain-restaurants, up 13%, to apparel shops, with a reported increase of 100%. Furthermore, more than half of the chain store supermarkets built or remodeled in 1955 were air conditioned. (The magazine defines "Chain" as any firm with two or more outlets).

$77,000,000 for chain-store air-conditioning in 1955

CHAIN-STORES FIELD	1955 EXPENDITURE	CHANGE VS. 1954
Grocery-Supermarket	$33,000,000	+65%
Variety	12,000,000	+26%
Fountain-Restaurant*	9,000,000	+13%
Drug	4,500,000	+80%
Dept. Store—Gen. Mdse.	4,500,000	No change
Apparel	4,000,000	+100%
Shoe	2,800,000	+55%
All Other	7,200,000	+26%
TOTAL	$77,000,000	+42%

*Does not include installations in fountain-restaurants located in drug and variety chain stores.

(Courtesy Chain Store Age)

CHART on left shows air conditioning expenditures in millions of dollars as made by chain stores since 1949. On the right is a breakdown by type of store showing how much was spent for air conditioning during 1955 as compared to 1954.

National Tea Plans 90 Markets for '56

CHICAGO—National Tea Co. plans to open 90 retail stores this year, according to H. V. McNamara, president.

Seventy-seven of the stores will represent expansion into new locations and 13 will represent relocation of existing stores.

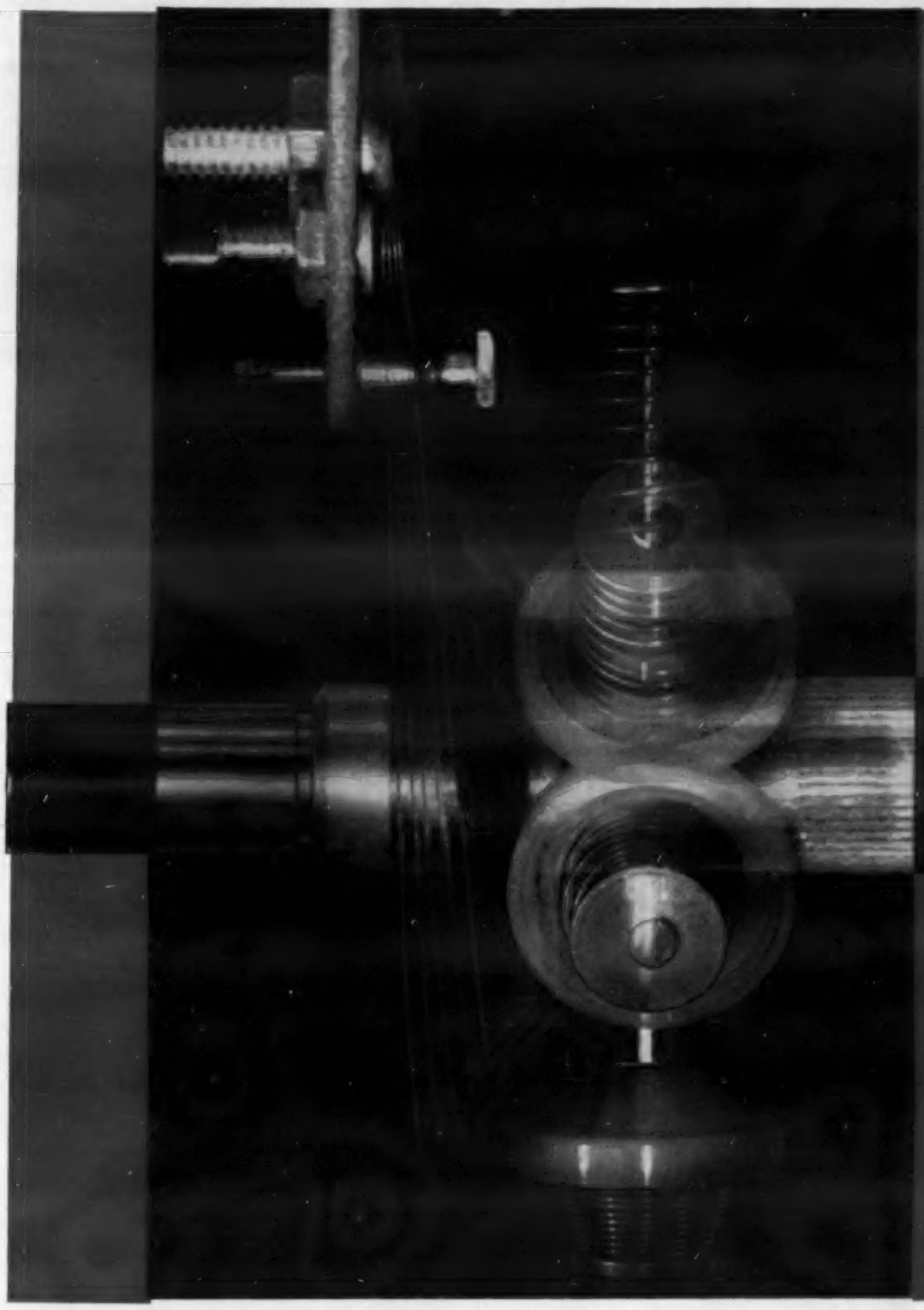
Last year, the company opened 83 stores, including 56 new locations. However, the total number of stores in operation increased to only 744 from 711, reflecting the closing of smaller stores, it was pointed out.

York-Houston Holds First Dealer Meeting

HOUSTON, Texas — The newly-organized York-Houston Sales, Inc., held its first dealers meeting recently at the Shamrock Hilton hotel, with about 100 dealers present.

Participants in the meeting included R. E. Cassatt, commercial sales manager for York Corp.; J. J. Sullivan, manager for room air conditioners; W. W. Miller, commercial district manager for York; and Joseph G. Thompson, president and general manager of the Houston subsidiary (York-Houston).

For more information about products advertised on this page use Information Center, page 66.



GM GENERAL MOTORS
DELCO
DAYTON OHIO

most UNCOMPLICATED starting switch going

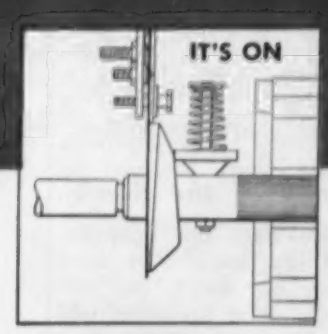
ANOTHER EXCLUSIVE FOR DELCO *Electric* MOTORS

That's all! Just three simple parts *snap* open the starting switch on Delco FHP Electric Motors. This utter simplicity of action—compared to other switches with as many as 12 parts—means longer switch life, fewer service problems and greater customer satisfaction with your product. And the switch is practically noiseless when starting and stopping.

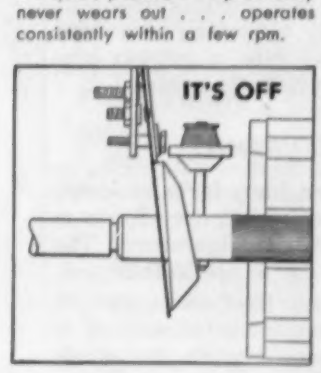
This exclusive Delco Products starting switch has other advantages, too. It acts consistently within a few rpm of the same speed every time—time after time after hundreds of thousands of times. The nylon weight is free to rotate when in contact with the ceramic-coated contact arm, practically eliminating wear. The spindle is self-cleaning so dirt, corrosion or rust cannot interfere with its operation—as they can with conventional designs.

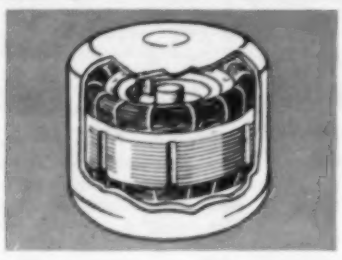
This is a sample of the kind of superior engineering that makes Delco electric motors the right motors to power your product.

Get the facts on the Delco electric motor for your particular needs. Contact your nearby Delco Products Sales Office or Delco Products, Dayton, Ohio.

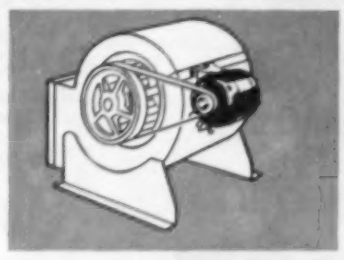


It's quiet, positive . . . practically never wears out . . . operates consistently within a few rpm.

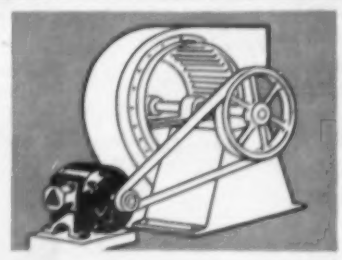




DELCO PRODUCTS HERMETIC MOTORS for refrigeration compressors. Four-pole models, 1/12 to 10 hp; two-pole, ⅛ to 15 hp.



DELCO PRODUCTS BELT DRIVE MOTORS. Split-phase, capacitor-start, and polyphase fhp models for fans, blowers and compressors.



DELCO PRODUCTS POLY-PHASE INTEGRAL HP MOTORS in rerated NEMA frames now provide more power per pound.

GM GENERAL MOTORS
DELCO DAYTON OHIO

DELCO *Electric* MOTORS

DELCO PRODUCTS, DIVISION OF GENERAL MOTORS, DAYTON, OHIO

Proved best by Performance!

For more information about products advertised on this page use Information Center, page 66.

Inside Dope

By GEORGE F. TAUBENECK

(Concluded from Page 1, Col. 1)

Hertzler, a 50-year-old Lehigh university graduate spent 24 years with York Corp. prior to his resignation in 1954.

Now occupied with seeing party leaders in his district, Hertzler writes that "a comparative analysis of the service I may be able to render my community and my state prompts me to reach this decision" of working for the GOP nomination to Congress. Good luck, Johnnie!

Post Scripta

There are two common tragedies in human life: One is to be unable to get the thing one most desires; the other is to get it.

Nevertheless there are two wishes, which if attained lead straight to happiness. Human hearts and treasureholds swing open before them. One is, to be lovable; the other, to be useful. For the person who is both lovable and useful holds the key to real happiness, and to all the wealth he can properly use.—*Nuggets.*

The best thing about color TV is that so far the Joneses haven't been able to afford it either.

"You must admit that men have superior judgment," posed Hubby.

"Obviously, dear. You married me. And I married you."

"Now, what I want," confided the new sales manager, "is a chart that will show me at a glance what charts we've got."

Philosophy of the Week

When we hate our enemies, we give them power over us—power over our sleep, our appetites, our blood pressure, our health, and our happiness. Our hatred is not hurting them at all; it only turns our own days and nights into a hellish turmoil.—*Baptist Observer.*

How Inefficient!

Let's consider, for a moment, the matter of left-over foods in our nation's refrigerators. The factual data is terrifying.

Assuming that there are 50 million electric refrigerators in use, and that each housewife has 10 little jars and dishes with bits and doodads of mashed potatoes, creamed peas, carrots, spinach, broccoli, sour milk, sour cream, banana pudding, bacon fat, beef fat, and left-over pie crust dough, there could be a total of 500,000,000 small containers holding odds and ends which a thrifty housewife hates to garbage-pail.

Normally her refrigerator procedure can be charted. Left-over bits go into small dishes and, by the inexorable laws of gravity, move gradually to the back of the refrigerator shelves where they repose an average of 17 days. At the end of this 17-day period, those left-overs either become stomach troubles, or are cleaned out—whereupon the whole process is repeated.

What a selling point for home freezers!

Believe It or Not

Eighty-six per cent of all sales are made after the fifth call, according to the National Sales Executives Club.

Most salesmen miss the boat, because 48% of them call only once on a prospect.

Fewer and fewer call two or three times.

Only 10% keep trying for the order after five calls. The latter strike pay dirt 72% of the time.

Shall We Fundamental?

Psychologists and psychiatrists agree that basic needs of mankind are love and affection. One can't be his best if he is not loved and wanted.

From earliest infancy to old age this feeling of being deeply valued is an important precondition to meeting life's challenges, taking life in stride, and doing one's best without undue stress and strain.—DR. ALFRED WHITEHEAD.

"Life gives you what you want if you want it long enough, but not at the time you want it most."—DR. ALBERT EINSTEIN.

Last April Dr. Albert Einstein died at the age of 76. He announced his theory of relativity (which brought him world-wide fame, and eventually resulted in our atomic age) when he was only 26.

"The most beautiful thing we can experience is the mysterious. It is the source of all true art and science. He to whom this emotion is a stranger, who can no longer pause to wonder and stand rapt in awe, is as good as dead: his eyes are closed," Einstein testified.

When we look at what we want and then compare that with what we have, we shall be unhappy. When we think of what we deserve, then of what we have, we shall thank God. —T. D. LITTLE.

If it were decided to declare a dividend and to present to every family of three in the U. S. a bonus of $2,100, the total cost to the Treasury would not equal the amount which this nation has given away to foreign countries since '40.—EUGENE W. CASTLE.

Every man who holds a big job gets there through luck. All he has to do is cultivate a pleasing personality, make himself well-liked by others, sow seeds of kindness and good cheer wherever he goes, perform his work better than the "unlucky" man does, render the most and best service possible regardless of the salary he is getting. Luck does the rest.—"RED" MOTLEY.

The first thing needed to make a dream come true is to wake up. —*El Mustang* magazine.

There isn't much fun in medicine, but there's a good deal of medicine in fun.—*Mutual Benefit Health & Accident Assn.*

Have you heard the new beatitude for administrators?

"Blessed are they who run around in circles, for they shall be known as big wheels."—*Nation's Schools.*

Men are not equal in intelligence and talents. Those who are more accomplished should not be penalized to further those who are not. Each individual, like water, will graduate to his own level of comprehension and the ability to achieve.—*Rosicrucian Digest.*

For more information about products advertised on this page use Information Center, page 66.

How Large Contractor Holds Key Members of His Organization

WASHINGTON, D. C.—How can the small business proprietor provide for his own retirement and assure the continuance of his business after he is gone?

Arthur S. Johnson, air conditioning and refrigeration contractor here, faced up to this question three years ago and believes he has worked out a satisfactory solution.

80-Man Organization

He operates an 81-year-old business started by his grandfather and carried on by his father before him. Thirty years ago, the firm was a one man operation. Today, it employs 80 persons in its sales, service, and maintenance departments.

Johnson's problem was his own replacement. There is now no one in the family to step in if he wants or has to step out.

"For many years I was concerned with the thought of what would happen to this organization that I worked so hard to build to its present size if I should suddenly pass away, take ill, have to retire, or decide to go on a semi-retirement basis," Johnson related.

"Would it suddenly cease to exist? Would my widow have something to sell? Could I still draw some kind of income from it if I desired?"

Employe Turn-Over Was Major Problem

Johnson felt, that as long as he was around to oversee operations, everything would run smoothly, even if he didn't carry on many duties himself.

But the turn-over of his employes was a matter of additional concern. No sooner did a man know his job well, than he left to go into business for himself or to join another establishment.

As new employes replaced the old, Johnson instructed them and broke them in to his way of doing business. But if he left his business for any length of time or went into semi-retirement, then he was again faced with the same problem that was troubling him. So he decided once and for all to remedy this situation and set his mind at ease.

Johnson broke down his organization into five departments. He designated a head for each department such as an office manager, sales manager, air conditioning and refrigeration engineer, sheet metal shop foreman, and a service manager. He spent months studying each man and when he felt that he had top-flight personnel, he called them into a special meeting.

ARTHUR S. JOHNSON meets with key personnel, who are gradually acquiring ownership of the business. This plan was devised to provide for the continuance of the 81-year-old contracting firm after the retirement or death of Johnson. The plan also reduces to a minimum turn-over of top men.

5 Employes Given Chance To Acquire Interest

These five employes were told that they would have the opportunity to obtain 48% of the stock in the company. Each employe was advised how much of this stock he could obtain, based on his value to the company.

This stock was to be his at the completion of five years of service with the company, with each employe receiving his pro rata share each year.

If any employe left the company before the five years was up, he had to sell his share of stock in equal portions to the remaining group, at a predetermined price per share.

"The same situation holds true after five years and thereafter," explains Johnson. "In other words, it had been decided that the company was to remain in the hands of the five employes and myself.

"Anytime that anyone quit, decided to tear away, or passed away, his share of stock had to be sold in equal proportions to the remaining group."

Insurance Covers Stock Purchase Price

As an added protection, the A. S. Johnson Co., provided every one of these employes with insurance in an amount that would cover the sale of the stock to the other members. This sum was to go to the widow, heirs, or estate of the deceased.

"In this way, if a certain employe wasn't doing a good job by the standards of the other members of the group, he could be released from his job by majority vote and his share in the company bought out.

"If he quit, he would be reimbursed for the shares of stock already assigned him and if he passed away, his insurance covered the amount of stock already assigned him.

Key Men Assured of Bright Future

"But by the same token, these employes were assuring themselves of a future in this business because they were becoming part owners, without any cost to themselves."

Johnson realized that he was giving away 48% of his company without any cost, but he also realized that at long last he had the opportunity to go into self-retirement, take extended vacations, and provide something for his estate if he passed on.

"But even more important was the fact, that the top flight experienced personnel that I had trained and broken in were here to stay," says Johnson.

"The better a job they did for the company, the better a job they did for themselves, because it reflected in increased earnings and stock value.

"Normally our annual sales ran somewheres around $300,000. The first year that the plan went into effect, they increased to $500,000. Last year they reached $750,000."

For more information about products advertised on this page use Information Center, page 66.

Drugstore Air Conditioning

It Boosts Traffic; Lengthens Shelf Life of Drugs, Candies, Rubber Goods; Keeps Employes Happier and More Efficient

DETROIT—In addition to attracting more customers and making employes more happy and efficient, air conditioning in a drugstore helps to cut spoilage losses or up profitability in other ways, in every one of the many departments found in the modern drugstore.

This has been demonstrated in surveys of drugstore operations, results of which have been reviewed by Ken L. Crapeau, sales manager of the Airtemp export division, and the following conclusions drawn:

In the pharmacist's workroom—the heart of the drugstore, the blending of drugs for the filling of prescriptions is easier, simpler, and much more effective if the temperature is held below 78° F. and the relative humidity stays below 50%.

It noted that the pharmaceutical department must stock thousands of items for extended periods of time and have them in good condition when needed. Once a glass or plastic container is opened, the moisture in the air entering the container will do untold damage to the remainder of the contents.

To make it possible to stock all types of medicines, and have them fresh when required, air conditioning is the only answer.

In the rubber goods department, air conditioning completely eliminates temperature and humidity damage, which, under severe conditions, can make as much as 25% of the stock completely unsalable or salable only at marked down prices.

Rubber Goods Can Be Stored for 24 Months

Rubber goods, such as syringes, eye droppers, elastic stockings, gloves, etc., can be stored or displayed for 24 months or more in a properly air conditioned area and still retain its original elasticity.

In the candy department, druggists will find few candy or cough drop manufacturers who pay any attention to packaging protection against temperature and humidity.

When temperatures stay above 80° F. and the relative humidity above 55% for extended periods of time, candies and cough drops lose their original appearance to a point making them completely unsalable.

PRACTICALLY every department of drugstores, both new and existing, can benefit from installation of packaged air conditioners such as is shown above.

Air conditioning not only enables the druggist to merchandise every item he bought, but will also make him more competitive price-wise. He will not have to mark-up his prices to cover contemplated losses.

Lunch Counter Suffers From Heat

The lunch counter is another casualty in hot, humid weather. The druggist suffers losses when the cheese dries out, the lunch meats spoil, and cakes with chocolate frosting turn gooey and cannot be sold. Profitable hot coffee sales fall off during morning and afternoon coffee breaks.

All this can be prevented with air conditioning, while the air conditioned lunch counter becomes a magnet for workers in hot and humid offices or shops. Not only more customers come, but they stay longer, increasing lunch counter profits.

In addition to all these departmental advantages, air conditioning will also cut personnel problems for the druggist. Employes working in a comfortable atmosphere will be more tolerant and polite to customers and will have less dusting to do. Cooling will also lure additional good prospective employes to the store and cut down on personnel turnover.

10 Reasons fo Air Conditioning Drugstores

In conclusion, the review listed 10 reasons why the druggist cannot afford not to air condition.

They are:

1. **Less stock spoilage.**
2. **Better prescription filling.**
3. **Cleaner shelves and stock.**
4. **More profits from lunch counter.**
5. **More customers coming in.**
6. **Customers stay longer and thereby increase their exposure to the merchandise.**
7. **Better employe relations.**
8. **Faster stock turnover.**
9. **Increase prestige in the community.**
10. **Increased net profit.**

Lewyt Names Distributor

BROOKLYN — Di Clemente-Voike, Inc., Rochester, N. Y., is the latest distributor to be named by the Lewyt Air Conditioner Corp., according to Irving Bottner, vice president.

The firm will handle Lewyt's built-in wall air conditioner in nine upstate New York counties.

For more information about products advertised on this page use Information Center, page 66.

For more information about products advertised on this page use Information Center, page 66.

$103 Cost Seen for Heating, Cooling Toledo Home In Year-Round Test Plan

CAN THIS HOUSE, located in the tough climate of the southern Great Lakes region, be heated for $84.80 and cooled for $18.80 during the next 12 months? Engineers predict that it can. Occupied by Mr. and Mrs. Paul Gettings in Toledo, Ohio, this is the first of more than 100 dwellings in 21 American cities to be used in a 2-year low cost comfort test program being conducted by Owens-Corning Fiberglas Corp. Objective of the program is to determine whether the average size home in the United States can be heated and cooled for $120 a year. This house has three bedrooms and 1,273 sq. ft. of floor space. Shown at the entrance of the house is Mr. Gettings.

THREE electric meters were installed on a special panel in the home occupied by Paul Gettings (shown here) and his wife as part of the procedures necessary to help determine whether the dwelling can be heated and cooled for $120 a year. The meter at left indicates electricity used for the home's air conditioner and furnace; the other two are used to analyze other electrical household uses.

OTTO SHOOK of the Ohio Fuel Gas Co. service department completes procedures which begin the flow of natural gas into the test house. Walter Weirich, service manager for Ohio Fuel's Toledo district, looks on. Predicted cost of heating and cooling this house is $103.60, according to engineers of Owens-Corning Fiberglas Corp. which is conducting the tests on more than 100 homes in 21 cities in all climatic zones.

TOLEDO—Tests began here recently on the first house in a two-year program to determine whether an average size American home can be heated and cooled for $120 a year.

The house is one of more than 100 dwellings in 21 major cities throughout the country to be tested in a program to determine costs for year-round comfort.

Predicted cost for heating and cooling the Toledo house over a one-year period is $103.60, according to Tyler S. Rogers, technical consultant for Owens-Corning Fiberglas Corp., which is conducting the program. This total is made up of $84.80 for heating and $18.80 for cooling.

When the prediction is adjusted to a base "standard test house" of 1,200 sq. ft. with fuel cost of 10 cents per effective therm and power cost of two cents per kilowatt hour, the average annual cost is predicted to be $119.30 for heating and cooling.

The Toledo test house, occupied by Mr. and Mrs. Paul Gettings of Toledo, is a one-story, ranch type dwelling with three bedrooms and 1,273 sq. ft. of floor space.

Favorable features of the dwelling, qualifying it for use in the test, include the proper insulation, orientation, shade, and ventilation in accordance with modern "comfort engineering" practices. These and other features help reduce heating and cooling costs, Rogers stated.

Separate meters have been installed on the fuel and power lines serving the heating and cooling units in the dwelling. This allows the Toledo Edison Co. and Ohio Fuel Gas Co., cooperating firms in the Toledo area tests, to isolate heating and cooling costs from other household operating expense.

This test house, built by Scholz Homes, Inc., of Toledo is the first dwelling to undergo actual testing in the current program.

Other test homes are under construction or are in the planning stages in Pittsburgh; Louisville, Ky.; Memphis; Kansas City, Mo.; Chicago; Minneapolis; Wichita, Kan; Boston; New York City; Baltimore; Atlanta; Jacksonville, Fla.; New Orleans; Houston and Dallas, Texas; Denver; Phoenix, Ariz.; Spokane, Wash.; Sacramento and Los Angeles, Calif.; and Toledo.

N. C. Firm Chartered

DURHAM, N. C.—Quality Air Conditioning Co., Inc. here has been granted a charter by Secretary of State Thad Eure. Authorized capital stock is $100,000. The incorporators were Richard R. Jones, Margaret B. Jones, and Henry Bane, all of Durham.

Cory Names Thompson, Lunney to Field Posts

CHICAGO — J. W. Alsdorf, president of the Cory Corp., has announced the promotion of Jack Lunney to territory manager for north and west Texas and southern Oklahoma with headquarters in Dallas.

At the same time, Frank Thompson, who has been Dallas territory manager, has been transferred as territory manager in Kansas, western Missouri, and northern Oklahoma with headquarters in Kansas City.

Before his promotion, Lunney was assistant territory manager for Chicagoland where he re-

Frank Thompson has been Dallas territory manager for over three years. Prior to accepting that post, Thompson was assistant territory manager for Chicagoland and had been a sales correspondent for Cory.

For more information about products advertised on this page use Information Center, page 66.

Motorized Damper Combined with Direct-Expansion Coil In 7½-Ton Remote Air Conditioner Solves TV Station's Transmitter Console Cooling Problem

PHOENIX, Ariz. — Replacing a television equipment manufacturer's built-in ventilating system with a 7½-ton Curtis air conditioning system was the means by which Newhall Brothers, air conditioning contractor here, solved a serious operating problem for KPHO-TV.

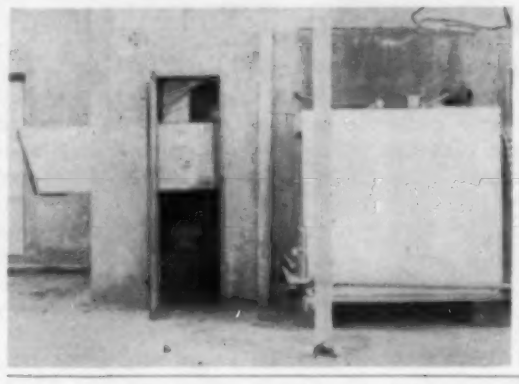
Equipment Generating 115-120° Temperatures

Last summer, when installing new, greater-wattage broadcasting equipment which would permit a greater range and a brighter picture on southern Arizona television screens, KPHO engineers found an unexpected problem. The equipment, housed in a series of metal consoles, was generating temperatures of 115 to 120° during Arizona's hot temperatures.

A "built-in" ventilating system consisting of an exhaust fan and duct across the top of the cabinets was insufficient to cope with desert temperature. The result was that hundreds of hot-filament tubes enclosed within the cabinet were burning out.

The $100,000 TV installation, even with 4,000 c.f.m. of air being whirled through the cabinets and through an outlet, was off the air disastrously on several occasions while engineers attempted to correct the problem.

The first step taken was the installation of a small package unit which was merely installed in the same room with the transmission equipment with the hope the circulating of cooled room temperature air would be adequate to whirl away the heat. This attempt proved useless, however, inasmuch as the operating consoles were manufacturing heat at a far greater rate than the system could remove it.



LEFT: Fresh air intake duct and compressor for cooling station KPHO-TV console. RIGHT: This duct from plenum provides cooled air into television transmitter.

A call went out to Newhall Brothers who have handled numerous air conditioning problems peculiar to the Arizona climate in past years on an emergency basis. A quick survey of the facilities, located in the famous Westward Ho hotel in downtown Phoenix, showed that the heat load was more than twice the amount expected. Newhall thus went to the basement of the hotel where the operating current for the TV broadcasting equipment was on a separate meter and calculated his load from meter demand.

This process, in combination with a check on the average heat generated within the equipment console, showed that slightly more than seven tons of direct refrigeration would be required to offset it.

Unit Remoted In Closet Due To Little Space

With little space available in the transmission equipment room, Newhall turned to a remote installation with a 7½-hp. Curtis unit located in a closet on the same floor. A single coil was installed at the side of the transmitter in a custom built plenum chamber finished to match the transmitter housing and over the original air intake. The same 8,000 c.f.m. blower was left in place while at the rear of the transmitter a collector duct was installed over the outlet for direct return of the plenum.

Dampers Closed Until Temperature Drops Below 70° Outside

For pressure operation when outside temperature drops a single traveler duct was built over the top of plenum and through the wall alongside of the transmitter. A motorized damper is provided at the intake entrance which keeps the dampers closed until exterior temperature drops below 70°

Through the combination of the motorized damper and the 7½-ton direct expansion coil, the interior of the transmitter console is under continuous cooling during all operating hours with outside air when the temperature is less than 80° being brought in through the exhaust system and the refrigeration coil cutting in whenever the temperature rises above 80° .

This unusual installation has laid the ground work for similar refrigeration in other Arizona television broadcasting stations, according to Newhall.

Duc-Pac Names Powers

EAST LONGMEADOW, Mass. —Duc-Pac, Inc. here, manufacturer of prefabricated duct and duct fittings, has announced that Richard L. Powers, Jr. of North Adams, Mass. will handle sale of its products in the upstate New York area.

Active in the domestic and light commercial heating and air conditioning field for many years, he was formerly connected with Powers Products, Inc.

For more information about products advertised on this page use Information Center, page 66.

Opportunity In Room Air Conditioners

College Retailing Study Entices Graduate Into Room Unit Sales; Beefs Up Business by Canvassing, 3-Point Strategy

SACRAMENTO, Calif. — No opportunities or chance for profit in selling room air conditioners at the retail level? Don't try to tell that to Lou Kovanda, age 27, who in something less than two years has gone from selling room air conditioners on a consignment basis to owning and operating two retail stores.

Furthermore, Lou is a college graduate (Stanford) who happened to select the selling of air conditioners and appliances at retail because of something he did in one of his college courses—a switch from the general attitude of college graduates who seem to shy away from retailing.

Don't be misled by this into thinking that Lou conducts his business on an "academic" basis. His "wheeling and dealing" tactics have earned him the label of "discount house" from many of his competitors, who have not been inclined to look too kindly on his selling methods.

Competition Gives Him Word-of-Mouth Advertising

However, they don't deny that Lou has moved a lot of merchandise, and apparently made money in the process. And Lou himself doesn't mind the label of "discounter"—he views it as good "word-of-mouth" advertising.

"Anything that makes people think yours 'is the place to go' is all to the good," is the way he reasons it. "We do a lot of advertising on 'deals' and 'specials' but it's mainly to get people to call us or come into the store. We don't cut prices to the bone on every deal—if we did we couldn't stay in business—and we try to sell up on every deal."

But let's get back to the beginning. What was it in his college experience that got Lou interested in selling room air conditioners and other consumer portable goods at retail?

"In one of my courses in Stanford's School of Business Administration," Lou relates, "we were given the problem of setting up and operating a theoretical small business. I chose the business of selling air conditioners at retail. The more I studied it, the more fascinated I became with it, and I decided that someday I would really get into the business."

He found a friend who said he'd go along with Lou on the venture, and in the spring of 1954 he started—for real—in the business of selling room air conditioners. How did he find his prospects at first? By an old—and almost forgotten technique. He went into areas where he thought there might be good prospects, and knocked on doors.

An opportunity presented itself to purchase a large lot of room units at dirt-cheap prices. Lou bought them and he knew exactly what he was going to do with them. A friend of his operated a barbecue stand at a good corner on a main street leading to a good suburban section. Making a deal with his friend, Lou piled the units up out in the open at the barbecue stand.

'Steal' Advertising Results In Just That

Passers-by were invited to "come on in and steal these closeout model air conditioners." Someone took Lou at his word and literally stole a couple of units. This resulted in a lot of publicity which served to center attention on the merchandising stunt—a type of advertising that he could hardly have bought.

He was on his way then. Manufacturers of appliances sought him out to handle their lines. He took on salesmen. Before the turn of the year he bought out his partner, and today he operates two retail stores and has a half dozen salesmen.

The young merchandiser is a heavy user of radio and newspaper advertising. He has found the classified advertising columns a good spot—it hits people who are real bargain hunters. But he claims he doesn't use phony "bait" advertising—when he advertises "repossessed" or "closeout" merchandise, he actually has some of it—but his aim is to sell up.

Main Points In Selling Strategy

The following are some of the main points in Lou's selling strategy:

1. Run the kind of advertising that will get a "bite" from people who have an intention to buy.

2. Build a reputation as the place where a good deal can be made for good merchandise.

3. Close as many sales as possible in the prospect's home.

"Closing in the home is important," Lou says. "That's the first thing we try to do when a prospect calls in—get a date to talk with him at home.

"There he can't shop or get a lot of misleading comparisons, and a salesman has a real chance to sell up."

Despite his reputation for "wheeling and dealing" Lou has not violated agreements he has made to not "football" certain types of merchandise. Norm Golden of Kaemper & Barrett, Amana distributor, says that Lou has been a top dealer in the northern part of California on Amana air conditioners, but has not violated the agreement not to advertise the units below the stated list price.

Customers who refer other prospects to Lou's stores that result in sales are often rewarded with merchandise premiums, such as small appliances or leather goods items.

Lou's method of compensation for salesmen is based upon how good a job the salesman does. Within a certain range of gross margin of profit, the salesman gets a straight commission on the price at which the item goes.

If the price is over the top figure, Lou is inclined to split everything over that figure with the salesmen. If it goes below, the salesman can expect to take a lower commission, or sometimes he may volunteer not to take any at all, counting the sale as a piece of promotion.

For more information about products advertised on this page use Information Center, page 66.

Announcing **LEWYT BUILT-IN WALL AIR CONDITIONER FOR CONTRACTORS!**

NOW, you can sell built-in air conditioning for one room, two rooms, or every room in the house!

NOW, you can share in the profits of two great markets:

1. The NEW HOME MARKET!
2. The HOME REMODELING MARKET!

Lewyt opens a great new profit opportunity for Air Conditioning, Plumbing, Heating, Electrical and Remodeling Contractors! The amazing Lewyt is a totally new idea—lets you sell built-in wall air conditioning for less than the cost of window units! Installs easily in frame, brick, stucco and cement walls! Can be used in homes, residential projects, commercial and industrial developments! Mail coupon, today, for details of a Lewyt Built-In Wall Air Conditioner Dealership!

Lewyt *doesn't jut out,* nothing mars the exterior beauty of your customer's home!

Each Lewyt is a self-contained unit with *built-in* controls and thermostat!

Fits flush—*anywhere* in *any* outside wall!

NO DUCTS! NO PLUMBING! NO OVERHANG!
Doesn't block windows or cut off light! Installs under, over or next to windows, as well as near ceiling or floor!

ONLY LEWYT includes all these BIG "EXTRAS!"

- **COMPACT**—only 15" deep, 14⅜" high, 32⅞" wide!
- **COMPLETE**—each unit has built-in controls and thermostat!
- **FLEXIBLE**—can be installed in one or all rooms!
- **POWERFUL**—2-speed motor available in ½, ¾ and 1 H.P.!
- **FUNCTIONAL**—super cools, dehumidifies, filters and exhausts stale air!
- **HEATS**—reverse-cycle pump for heating—optional!
- **GUARANTEED**—5-year warranty! UL Approved!

LEWYT GIVES CONTRACTORS A COMPLETE "TRAFFIC-BUILDING, PROFIT-BUILDING" MERCHANDISING PROGRAM!

• Magazine Ads • Newspaper Ads • Direct Mail Campaigns • Showroom Displays • Builder Displays • Participation in local and national Home Shows

LEWYT BUILT-IN WALL AIR CONDITIONER
By the maker of the famous Lewyt Vacuum Cleaner

WRITE TODAY! Contact your nearest Lewyt Air Conditioner Distributor. If one has not as yet been appointed in your area . . . mail coupon to:

LEWYT AIR CONDITIONER CORP.
DEPT. AC-2
57th St. and 1st Ave., Brooklyn 20, N. Y.

Gentlemen: Without any obligation on my part, please send all details as to how I may qualify for a Lewyt Air Conditioner Dealer Franchise.

NAME_____
TITLE_____
COMPANY_____
ADDRESS_____
CITY_____ ZONE____ STATE_____

Installing A Year-Round Air Conditioning System—With Some New Twists

CHICAGO—A step-by-step demonstration of the installation of a year-round air conditioning system was a highlight of the "How To Do It Circus" at the recent National Association of Home Builders convention here.

With Ned A. Cole, chairman of NAHB's air conditioning committee as narrator, a two-man crew, with comparatively little experience in installing air conditioning, spent little more than one hour hooking up the essentials of the system.

1 The NAHB Research Institute recommended 220-volt wiring be installed in new homes. The service mast is a new idea so that incoming lines will clear obstacles. Stub-out below the meter box is for connecting remote unit.

2 100-amp service panel inside provides separate circuit breakers for every major demand. Furnace and air conditioner (refrigeration equipment) are on separate circuits.

3 Perimeter ceiling diffusers were selected for installation in Demonstration House. Mounting brackets, shown being nailed to rafters, support diffusers. Inlet side of diffuser grill is placed toward center of room. Outlet side is positioned so that air will blanket windows and doors. In normal installation, grill would be attached to diffuser after ceiling was finished.

4 Small diameter self-insulating ducts made of glass fiber and covered with vinyl plastic vapor seal make up the overhead distribution system. The duct material makes use of acoustical properties of glass fiber comparable to commercial practice. Ducts shown here were developed especially for attic and crawl space installation where installer frequently has trouble applying insulation and vapor seal to metal pipes. They are installed before ceiling is put in. Furnace with high plenum for housing evaporator coil appears at extreme right of picture. Note how pre-engineered take-off fittings slip inside of glass fiber ducts. Streamlining reduces air turbulence.

5 Joining straight lengths of new self-insulating air duct requires short metal sleeve fitting and roll of special adhesive tape. Installer with face toward camera is taping joint while helper holds duct in position. Pipe also can be mortised to fit around 45 and 90° metal elbows.

6 Installation of evaporator coil is simplified by prefabricated vertical plenum with convenient access door and special mounting tracks making it easy to slip coil into position when furnace is installed, or added later with minimum labor cost. Slim-boy type furnace is only 14 in. wide. Plenum is insulated on inside. Electric service to furnace at left.

For more information about products advertised on this page use Information Center, page 66.

7 Chilled liquid line is being connected between cooling coil in plenum and pre-wired, factory charged condensing unit with built-in liquid chiller. Plastic tubing with "snap-on" connection is used to carry the chilled liquid.

8 Chilled liquid lines are being insulated with pre-formed split insulation of glass fiber.

9 Vapor barrier is being stapled and the joints taped in a mixed operation. Installer uses a hand stapler for this work.

10 Over-all view of the demonstration house shows small amount of space given over to air conditioning. The liquid chiller outside the house (at right) contains the condensing unit with new type condenser in a weatherproof housing. Chilled liquid lines connect to the cooling coil in plenum of the compact furnace in the center of the house. Self-insulating air ducts carry conditioned air through the attic to counterflow perimeter ceiling diffusers in each room. Interest of builders in the demonstration is obvious.

Cole called this system an advanced concept of factory packaging and one which could be installed by the building trades generally available for project work with little possibility of error.

He explained that all parts making up the system could be produced by one manufacturer who would assume responsibility for the entire system.

American Air Filter Shipments, Earnings Up During Fiscal '55

LOUISVILLE, Ky.—American Air Filter Co., Inc. continued to show an increase in shipments, orders, and earnings during the fiscal year 1955, according to W. G. Frank, president, who recently released the annual report to the company's stockholders.

Net shipments were $30,270,702 for the fiscal year ended Oct. 31, 1955, as compared with $29,376,740 for the previous year.

New orders booked totaled $30,570,000, which represented a $4,393,000 improvement over the year before. Unfilled orders totaled $11,300,000 for 1955 compared with $11,000,000 for 1954.

Net profit was $1,734,296 as compared with $1,387,429 for the previous year. Net profit equaled $4.07 per share of common stock, an increase of 81 cents per share over 1954.

Net worth of company was increased to $9,870,665 in 1955 as compared with $8,559,522 in 1954.

Illinois Engineering Co., a wholly-owned subsidiary in Chicago, had a successful year with a further increase in sales volume over its record of 1954, it was reported.

During the fiscal year 1955, Famco, Inc., an AAF subsidiary manufacturing glass fiber filters for furnaces and air conditioners and other glass fiber products, began construction of an addition to its Louisville plant which, when completed, will increase plant facilities by 60%

AAF's Canadian subsidiary, American Air Filter of Canada, Ltd., moved into its new combination factory and office building during 1955.

For more information about products advertised on this page use Information Center, page 66.

Real Cool Congress

Add Equipment for High-Speed Centrifugals In Capitol Cooling System In Washington, D. C.

LYNWOOD, Calif.—Two high speed units designed and manufactured by Western Gear Corp. here were shipped to Washington, D. C. recently for installation in York Corp.'s new air conditioning system to be installed at the Capitol power plant.

Two additional units will be completed late this year to complete the system, the statement continued.

Reported by government engineers as the largest hydraulic refrigeration system of its kind in the world, the installation will provide chilled water to a loop system holding 600,000 gals.

Buildings to be serviced include the Capitol, Supreme Court,, two House offices, Senate office units, Library of Congress, and the Library annex. A new Senate office building when completed will also be linked to the air conditioning system, it was added.

Western Gear's high speed units will be connected to 2,500-hp. synchronous electric motors and will step up their speeds from 900 r.p.m. to 4,870 r.p.m. as required by the centrifugal compressors.

Western Gear is a designer and manufacturer of mechanical power transmission and special machinery.

Many of its units are installed in major air conditioning systems throughout the country, according to the announcement recently released by the firm.

Drayer-Hanson Orders Show Big User Range

LOS ANGELES — Fred E. Schmuck, sales manager of Drayer-Hanson, Inc., reports that a check of new orderboard activity from the company's national representatives reveals an unusually wide range of applications.

Included in recent company orders are such diverse jobs as the Arizona Children's Colony, Randolph, Ariz.; the Union Bus Terminal, Miami; and the new 5-story New York Life structure in Los Angeles.

Institutions and churches in this category include the Veterinary Research Center, Louisiana State university, Baton Rouge; the Opelousas General hospital, Opelousas, La.; the Temple Emanu-El, Dallas; and the Veterans of Foreign Wars building, Austin, Texas.

Production Area In New Carborundum Plant To Be Kept at 72° F., 32% R. H.

LOGAN, Ohio—A precise process air conditioning system and automation for high speed production of abrasive wheels will be incorporated in a $3 million plant being built here for the Bonded Products Div. of Carborundum Co.

Production and office areas as well as a full-equipped cafeteria will be completely air conditioned.

The plant is being erected on a 50-acre plot. It will contain a gross floor area of 130,000 sq. ft. of manufacturing and office space, with a 65-ft.-high, four-story tower section of approximately 30,000 sq. ft.

High-speed elevators will cart raw materials from rail siding to the high storage section where they will be discharged into 216 vertical classifying bins and conveyed by gravity to the batch mixers at the second floor elevation.

An automatic, centrally-controlled system of conveyors will transport the mix to various locations in the molding area. From there the product will pass into automatic high pressure, gas-fired ovens and then to the final wheel finishing operation.

The precisely controlled air conditioning system will have a combined refrigeration system using low temperature water and mechanical refrigeration. In the process areas, a temperature of 72° F. and 32% relative humidity must be maintained within a tolerance of 1%.

Additional process equipment includes two 400-hp. gas-fired, high-pressure steam boilers, a 3,000 p.s.i. hydraulic system, compressed air, cooling water, etc.

Construction is of reinforced concrete and structural steel with 40 by 40-ft. bays and 20-ft. high ceilings throughout the manufacturing area.

The plant was designed and is being built by Brown & Matthews, Inc., New York. It is scheduled to be opened for operation in late spring.

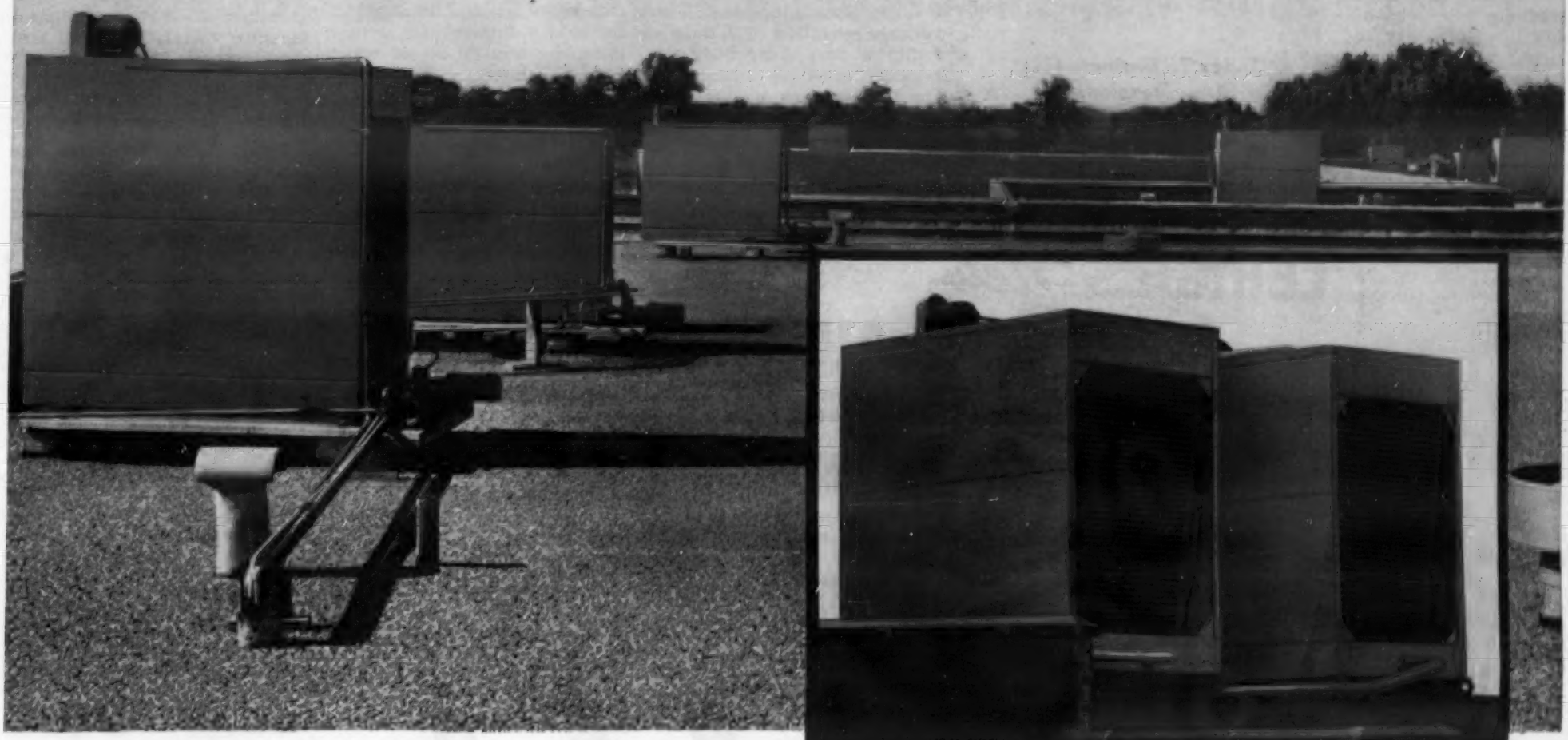
Bohn Appoints Westover

DETROIT — Terry W. Kuhn, executive vice president, Bohn Aluminum & Brass Corp., has named M. R. Westover as assistant to the executive vice president.

Westover joined Bohn in 1934 and has occupied several sales positions. Most recently he was general sales manager.

For more information about products advertised on this page use Information Center, page 66.

10 MAJOR FOOD CHAINS* SPECIFY HALSTEAD & MITCHELL COOLING TOWERS!



*Names sent on request

Why?

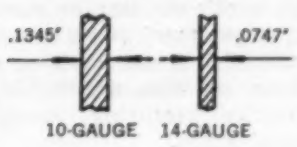
Chain store *engineering departments* specify cooling tower quality—as they do the quality of all other mechanical equipment which goes into their food stores. That's why ten of the country's major chains now specify Halstead & Mitchell Cooling Towers.

The longer equipment continues to operate efficiently, the lower its cost per year becomes. That's basic economics, and that's why 9 of the 10 chains which have specified H & M, specify in particular the CT Cooling Tower. The CT is the tower that lasts *years* longer.

ONLY HM CT TOWERS OFFER ALL THESE ADVANTAGES

10-Gauge Sheet Steel Cabinets

Halstead & Mitchell is the only cooling tower manufacturer to make cabinets of both 10-gauge and 14-gauge steel as part of its regularly scheduled production. The extra-heavy 10-gauge steel stands up to corrosive attack by water and chemicals for years longer than the lighter 14-gauge steel.



BY THE YEAR, 10-GAUGE TOWERS COST LESS

For example, on a cooling tower which might cost $3,000 installed, extra cost of 10-gauge over 14-gauge steel would be about $140 . . . less than 6% of total cost. For this 6% the owner gets years of added service, for tower life is in a real sense proportional to steel thickness.

The Protected Steel Concept

Here's real protection for sheet steel cabinets—hydraulic painting with Vinsynite, Vinyl Zinc and chlorinated rubber—protection against corrosion years ahead of any other—*forced* into every opening so that not the slighest corner goes unprotected.

Stainless Steel Fans and Shafts

Here's maximum protection against corrosion. Deep-pitch, 4-bladed fans for quiet operation are made of stainless steel. Shafts, too, are stainless steel for the absolute safety value in rust prevention.

20-Year Guarantee! on the wetted deck surface against rotting or fungus attack

Only Halstead & Mitchell pressure-creosotes all wood used in its cooling towers to provide the most satisfactory protection known against rotting, fungus attack and corrosives in cooling water. That's why you get the "20-Year Guarantee" *only* from Halstead & Mitchell.

And Everdur Bolts For Ease of Disassembly After Years of Operation!

AT LEADING WHOLESALERS EVERYWHERE • WRITE FOR CATALOG CT 584

HM

Halstead & Mitchell

BESSEMER BUILDING, PITTSBURGH 22, PA.

'Desk' Workers Hardest Hit by Heat

Heat Stress Draws Blood to Skin, Ups Sweat Production, Study To Develop Index of Heat Effect on Work Indicates

CINCINNATI — Persons performing some kind of mental activity, which in the working world means primarily office workers and professional people, suffer the greatest effect on their work from heat stress.

This was brought out in a study made by Professors H. S. Belding and T. F. Hatch, of the Graduate School of Public Health, University of Pittsburgh, which was reported in the paper "Index for Evaluating Heat Stress in Terms of Resulting Physiological Strains," presented before the recent meeting of the American Society of Heating and Air Conditioning Engineers.

Mild to moderate heat strain, the authors said, is more likely to affect the performance of office workers and others engaged in mental work, rather than those engaged in ordinary physical effort. Severe heat strain will affect both mental and physical work, and will involve a threat to health unless the workers are very physically fit.

Index To Evaluate Heat Stress Developed

Purpose of the study was to develop some sort of an index for evaluating heat stress in terms of its effects on humans, and which could be used by industry and government for such things as regulating the work of men in hot climates, and reaching decisions regarding the relative need for remedial action, either to improve an environment or lighten the work required in an environment.

While there are many manifestations of heat strain, including thirst, increased blood volume, sensation of fatique or faintness, and rising body temperature, most are dependent on the two primary strains which are directly operative for the removal of heat.

The first primary strain resulting from heat stress is marked increase in circulation of blood to the skin, the authors point out. This brings internal heat to the skin; it also raises skin temperature, thereby increasing the temperature (and potential vapor pressure) gradient between skin and environment.

Among the secondary manifestations of this strain are increased heart rate, flushing of the skin, faintness and perhaps lassitude, any or all of which may be related to the diversion of blood supply from the body core to the skin.

While for totally fit persons this strain is limiting only when the sweat which is secreted cannot be evaporated, for persons with impaired cardiovascular function, this strain will frequently determine endurance for heat.

Second primary strain is the production of sweat. To the extent that such sweat is evaporated, this is a useful function. Some secondary manifestations of the operation of the sweating mechanism are thirst, salt depletion (which sometimes results in cramps), and heat rash.

In developing an index for heat stress, the authors worked with the knowledge that sweat rate is one of the primary manifestations of heat strain, and came to the conclusion that sweating shows the highest separate correlation with presumed stress.

Top Sweat Capacity of Fit Person Is 1 Liter an Hour

Thus they developed the theory that the maximum capacity of a fit, acclimitized young man seems to be 1 liter of sweat per hour. The index value 100 is therefore specified to represent a sweat rate of 1 liter per hour. Evaporation of a liter of sweat requires about 2,400 B.t.u.

However, there would be very few people who could stand up to this index of maximum heat stress through a working day, and from their actual studies and tests the authors developed an "evaluation of index of heat stress" in terms of what they describe as "Physiological and hygienic implications of 8-hr. exposures to various heat stresses."

Implications of 10 to 30 Heat Stress Index

In the index of heat stress from 10 to 30, the following are the implications:

"Mild to moderate heat strain. Where a job involves higher intellectual functions, dexterity, or alertness, subtle to substantial decrements in performance may be expected. In performance of heavy physical work, little decrement expected unless ability of individuals to perform such work under no thermal stress is marginal."

Index of 40 to 60 Explained

With an index of heat stress in the order of 40 to 60, the following will pertain:

"Severe heat strain, involving a threat to health unless men are physically fit. A break-in period is required for men not previously acclimatized. Some decrement in performance of physical work is to be expected. Medical selection of personnel is desirable because these conditions are unsuitable for those with cardiovascular or respiratory impairment or with chronic dermatitis. These working conditions are also unsuitable for activities requiring sustained mental effort."

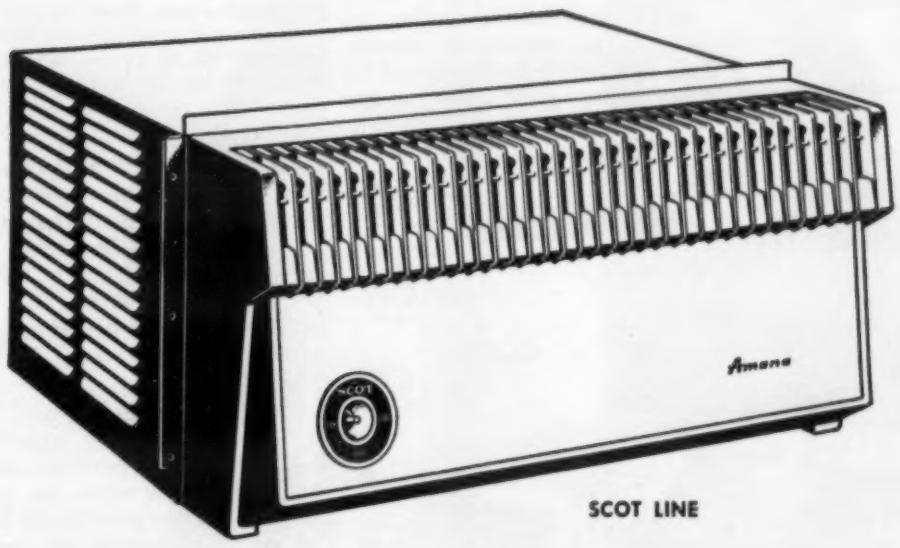
In the index of 70 to 90 the following is the evaluation:

"Very severe heat strain. Only a small percentage of the population may be expected to qualify for this work. Personnel should be selected (a) by medical examination, and (b) by trial on the job (after acclimatization). Special measures are needed to assure adequate water and salt intake. Amelioration of working conditions by any feasible means is highly desirable, and may be expected to decrease the health hazard while increasing efficiency on the job."

For more information about products advertised on this page use Information Center, page 66.

PROVEN PROFIT FORMULA FOR AIR CONDITIONERS!

Amana dealers discover a success plan that really works!



SCOT LINE

1. BUILD LIVELY FLOOR TRAFFIC with super-thrifty "Scot" merchandising models! Sell genuine, big-capacity Amana Air Conditioners for less than others charge for under-powered, over-rated units! Features mighty Powerpac Refrigeration Unit with amazing power in reserve. Single knob control. ½ and ¾ horsepower models.

DELUXE LINE

2. *SELL UP* TO SUPER-VALUE "DELUXE" MODELS. Cash in with exclusive features folks go for! Jet-Flow Cooling boosts capacity as much as 20%! Wall-of-Silence makes Amana the quietest Air Conditioner made. Automatic Thermostat. 100% air filtration. Handsome brown or ivory cabinets. ¾-, 1-, and 1½-horsepower models fit any window, flush inside or out.

Here's how to reap record-breaking Air Conditioner profits in 1956! Just follow this proven Amana Profit Formula:

(1) A model to meet every need . . . (2) only finest quality units . . . (3) protected profits . . . plus (4) powerful advertising and promotion!

WHY *Amana* DEALERS MAKE HIGHER NET PROFITS

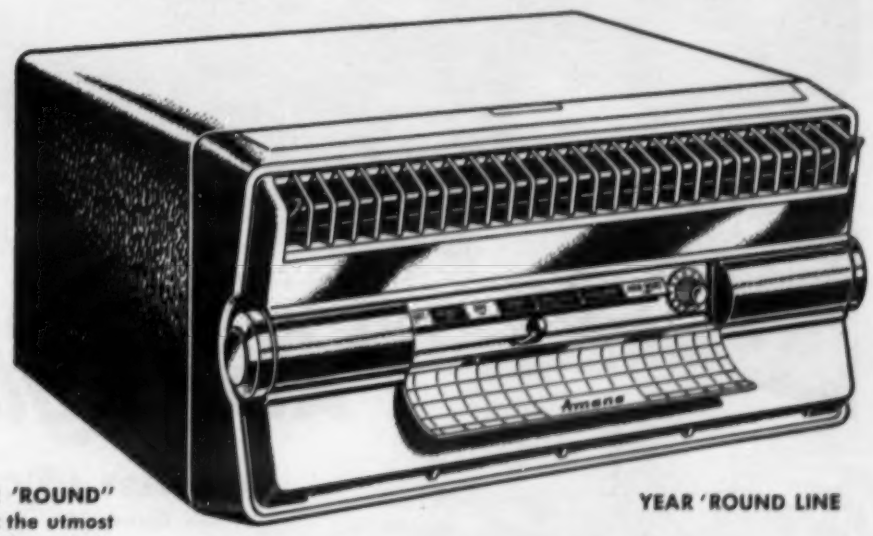
Amana gives you nine superior Air Conditioners in three big-volume price groups. Husky, big-capacity, honestly-rated units. All designed for effective "step-up" sales. *A model for every prospect.* And traditional Amana quality makes every customer a loyal booster!

Consistent national magazine and TV advertising *pre-sells* Amana Air Conditioners for you! Locally, powerful co-op ads pull folks in to *buy from you!* Amana puts more money in your pocket . . . money you can *keep!* Constant top quality—and the highest trouble-free performance record in the industry — *protect your profits!*

WHY '56 LOOKS BETTER THAN EVER

Last summer, Amana Air Conditioner sales shot up 313%! Dealers *know* the Amana Profit Formula *works.* And they're out to set *new* sales and profit records . . . for now Amana has *three* "Step-Up" model groups, instead of two.

Want in on the fun? Wire collect, or write: Amana Refrigeration, Inc., Amana 14 Iowa. We'll send facts at once.



YEAR 'ROUND LINE

3. *SELL UP* TO RICH-PROFIT "YEAR 'ROUND" MODELS. Delight customers who seek the utmost in luxurious comfort! Provides true balanced climate—all year! Every feature of the "Deluxe," plus: exclusive activated charcoal Amana-Magic Filter, Single-Knob Glider Control, Dial-Matic Timer—even a Chill-Check Heater! ½-, ¾-, 1-, and 1½-horsepower models.

Amana
Air Command
ROOM AIR CONDITIONERS

New *Amana* System Air Conditioning, Too!

Compact, self-contained unit fully cools any home! Amazing prefab air ducts make installation quick, easy . . . in attic, basement, any unused space. Entirely air-cooled. No pipes. No water.

AMANA REFRIGERATION, INC., AMANA 14, IOWA

World's Largest Manufacturer of Food Freezers • Producer of Freezer-Plus-Refrigerators • Built-Ins • System and Room Air Conditioners

Backed by a Century-Old Tradition of Fine Craftsmanship

For more information about products advertised on this page use Information Center, page 66.

Miami Apartment House Coin-Operated Built-In Room Units Arouse Interest

MIAMI, Fla.—An installation of coin-operated room air conditioners for an apartment house here has aroused considerable interest among other builders and apartment house operators.

Tropicaire Engineering Co. installed 250 Lewyt "through-the-wall" room units, to be operated by a coin-operated mechanism, in the new Parkleigh House at 520 Biscayne Blvd.

Tropicaire worked with Thomas Wohl, local builder who believed that there might be a number of advantages in apartment house air conditioners operated at the discretion of the occupants.

Wohl, who has had some experience in operating motels, feels that the policy followed by many motel operators is not the ideal solution. This policy is usually to offer air conditioning at $1 per day more than regular rent. Wohl's feeling is that it would be better to let the patron decide when and how much air conditioning was needed, and pay only for what was used.

ILLUSTRATING the "pay-as-you-cool" setup in Parkleigh House, Miami, Fla., the coin-operated Lewyt through-the-wall room unit accepts 5, 10, or 25-cent coins so the tenant may buy air conditioning for as long a period as he likes.

In the "pay-as-you-cool" set-up in the Miami apartment house, a coin-operated timing mechanism for each air conditioner is set to provide six hours of air conditioning for just 25 cents.

This is based on an estimated cost of 3 cents per hour for current, and an additional 1 cent for each hour for maintenance.

The mechanism may be adjusted for longer or shorter periods, and to accept coins of 5, 10, or 25 cents. Up to 56 quarters may be deposited at one time to secure continuous cooling for a longer period of time.

Cost of the timing mechanism is said to be between $25 and $35. This includes a switch for starting and stopping, so that the patron does not have to use the entire six hours once the coin is inserted, he may portion out the time.

Gibson Introduces 2 Room Units To Meet Local Competition

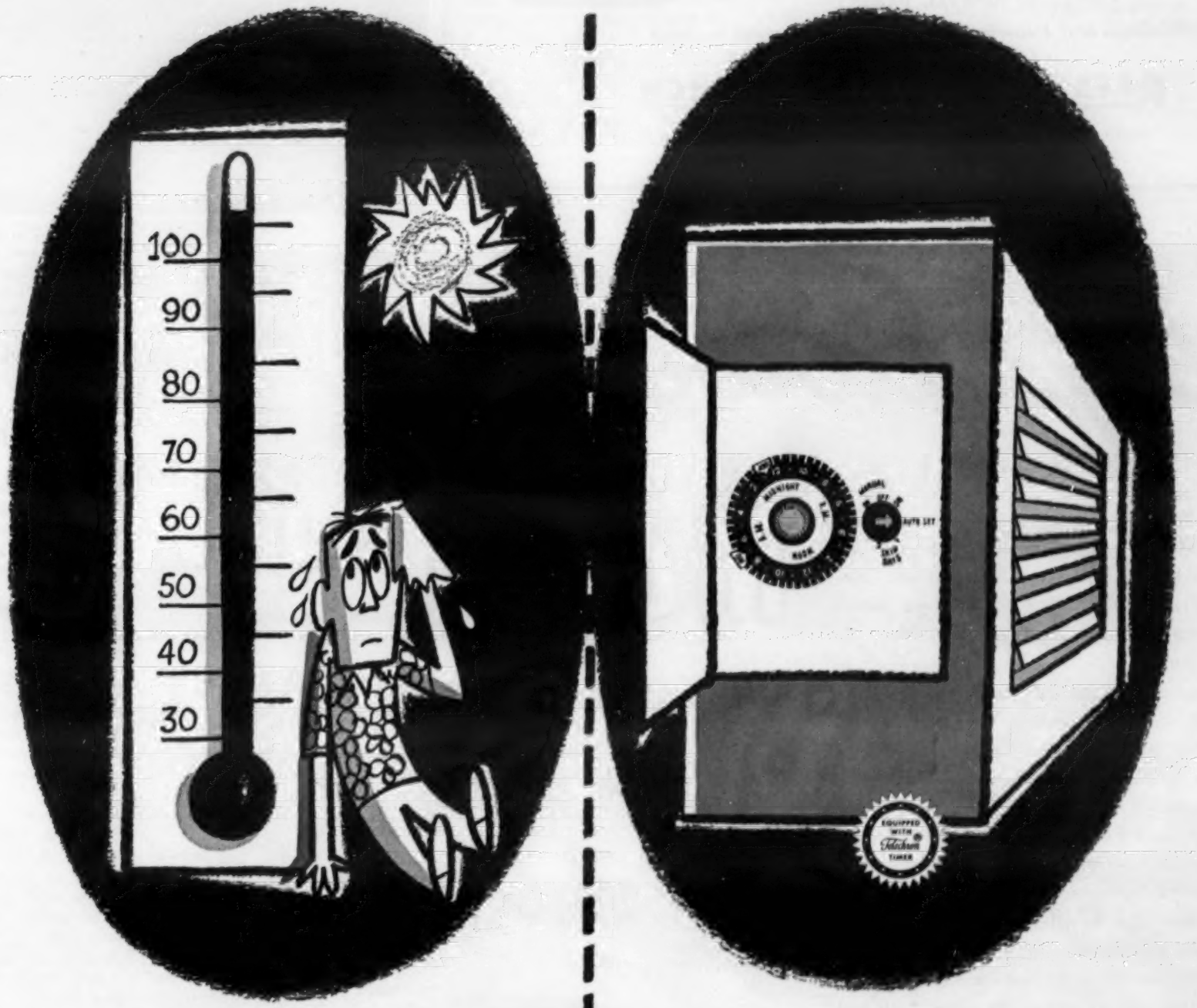
GREENVILLE, Mich. — Designed to build dealer traffic and for use in meeting local market competition, two new room air conditioners — ¾-hp. model GAC741B and 1-hp. model GAC142B — have been introduced by Gibson Refrigerator Co.

No suggested retail price has been set for either model. However, dealers can sell the ¾-hp. model for $199.95 and the 1-hp. unit for $229.95, it was announced.

The models, which draw 11.8 amperes, lack such features of deluxe and custom models as adjustable grille for 360° directional air flow, ozone lamp, and thermostatic control. Also, the cabinets are styled somewhat differently than deluxe and custom models, the manufacturer added.

For more information about products advertised on this page use Information Center, page 66.

NEW BUILT-IN Telechron Timers BOOST AIR CONDITIONER SALES!



No need to wait for this to interest customers

This new timer helps sell 'em now

Telechron Timer FEATURES HELP YOU CLOSE SALES...

TIMER OPERATES AIR CONDITIONER AUTOMATICALLY... SAVES MONEY!

1. Turns off air conditioning when you leave office. Turns it on before you arrive in the morning.
2. Lets you go to sleep in air conditioned comfort... then turns off air conditioner.
3. Skips week ends or holidays... automatically turns on air conditioner before you return.

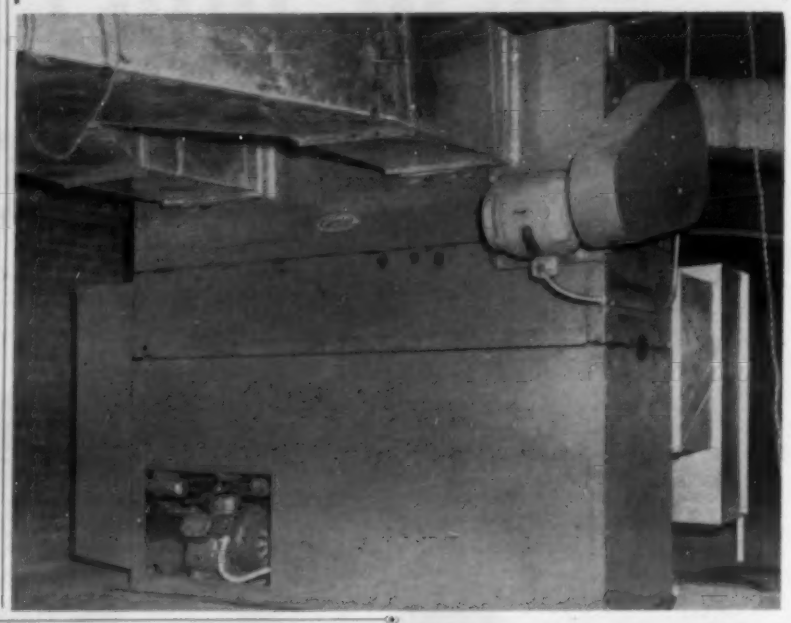
EASY TO USE... EASY TO DEMONSTRATE!

1. Set "on" control and "off" control for required starting and stopping time.
2. For week ends and holidays, just turn pointer to number of days to be "skipped."

Telechron Timers, Clock and Timer Dept., General Electric Company, 353 Homer Avenue, Ashland, Massachusetts

TELECHRON timers make sales easy...*automatically*

Packaged Air Conditioning Proves To Be 'Friend of the Court' In Memphis



RECORD time of only nine days was required to install this 20-ton Carrier unit above jury room of Federal Court in Memphis, run ductwork, and place cooling tower on roof.

Cool Court Keeps Calendars Current

By C. Dale Mericle

MEMPHIS, Tenn.—Packaged air conditioning went "on trial" here in Federal District Court late last summer, and the verdict of "not guilty" won praise even from the prosecution.

"Plaintiffs" in the case might be an apt description for Old Sol and High Humidity, and government red tape could have been called an "accessory before the fact" because of delaying the "trial" before Federal Judge Marion S. Boyd until the summer was nearly over.

When the okay finally came through from Washington, Judge Boyd "charged" Stephens Brothers, Inc., with bringing packaged air conditioning into court as soon as possible, preferably before that.

Only nine working days were expended by the firm, which is distributor for Carrier Corp. in this area, to have a 20-ton Carrier 41K24 package unit installed and ductwork run to cool the courtroom proper as well as the jury room.

"All of us are delighted with our newly air conditioned courtroom," the judge declared soon after the system was installed. "Stephens Brothers handled the contract in record time and their splendid equipment is doing a fine job every day."

The installation was by no means the simplest ever encountered.

"For one thing," points out William Counce, sales manager for the firm, "the courtroom has a heavy heat load. It's located on the top floor of the Federal building and there are skylights in the ceiling.

"Also, the occupancy load can vary considerably from day to day since some cases in court attract large crowds while others find only the principals but no spectators on hand."

The conditioner itself was located in attic space over the jury room and connected to ductwork. Cooled air is delivered to the courtroom through outlets in a section of the ceiling

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For more information about products advertised on this page use Information Center, page 66.

ONLY visual "evidence" presented in Federal District Court, Memphis, by a 20-ton packaged air conditioner are three outlet grilles in furred section of ceiling.

Cooling 'Influences' Court--

(Concluded from preceding page)

that had been furred out in original construction.

Getting from the equipment room to this furred section of the ceiling was hampered by a brick wall 3 ft. thick which had to be cut through for the duct.

The section of the building where the courtroom is located was built in the 1870's, which accounts for the thick brick wall, Counce explained.

A cooling tower was installed on the roof.

Court attendants indicate that air conditioning could be of considerable benefit in helping clear up court "calendars," which often are far behind.

Judge Boyd, whose calendar is always current, holds court in session from 9:30 a.m. to 5 p.m. —much longer than most judges do—when it seems necessary, and the court is in session more often.

Air conditioning is obviously a big help on this score during the long summers of Memphis.

One aspect of this installation evoked some wry comments—by defendents. As is its custom, the firm pasted a decal on the inside of the courtroom door when the job was completed reading: "Come again and enjoy Carrier air conditioning."

Carrier packaged air conditioners supplied by Stephens Brothers also got involved with Memphis police last summer. Five units were installed at the Memphis Central police station early last year by Hughes Heating Co., the mechanical contractor on the job.

Mitchell Holding Series of Regional Meetings on Commercial, Residential, Room Air Conditioners

CHICAGO—A cross country series of 12 regional sales meetings for distributors and dealers of Mitchell commercial and residential packaged air conditioners and room air conditioners has been scheduled by Mitchell Mfg. Co.

The first meeting will be held at the Knickerbocker hotel in Chicago on March 5. Sites and dates of subsequent meetings are:

Cleveland, Statler hotel, March 7; Pittsburgh, Carlton House, March 8; New York, Essex House, March 12; Atlanta, Dinkler Plaza hotel, March 15; Miami Beach, Empress hotel, March 19; New Orleans, Roosevelt hotel, March 21.

Houston, Shamrock hotel, March 22; Dallas, Adolphus hotel, March 23; Memphis, Chiska hotel, March 24; Des Moines, Savery hotel, March 26; Los Angeles, Beverly Hilton hotel, March 28.

Gibson Names United As New Orleans Outlet

GREENVILLE, Mich. — Appointment of United Distributors, Inc., New Orleans, as a new full line distributor for Gibson appliances was announced recently by Gibson Refrigerator Co.

The new distributor replaces Phillips Supply Co. Officials of United Distributors are J. L. Rosenblum, president; R. R. Sanders, vice president and sales manager; E. J. Passmore, treasurer; and R. Carrie, secretary.

Selling Preventive Maintenance

Don't Wait Until Prospect Is In Trouble To Sell Contract or He May Think You Are Taking Unfair Advantage

By O. F. Depperman

There are two main thoughts in this condensed version of a talk which O. F. Depperman gave before a meeting of the Midwest RSES. One is of interest to all air conditioning and refrigeration dealers and service firms; the other is of interest primarily to those firms who do servicing only.

The two prime thoughts are these (1) There is a proper time and a proper method of selling "preventive maintenance"; (2) service firms should give more thought to merchandising, and in so doing should give some thought to changing the name that they go under.

Depperman is a Sales Management Consultant to the Refrigeration Wholesaler and Manufacturer, headquartering in St. Louis. For many years he was an executive with a leading wholesaler chain in the air conditioning, refrigerating, heating, and plumbing field.

The Refrigeration and Cooling industry is one of the fastest growing industries in the country but there is a strange thing about purchasing equipment of our industry—that is, the purchasing of equipment by the ultimate user.

The initial cost of equipment to provide the Refrigerated food or the cooling, seemed large possibly to the owner, at the time of purchase but the thought of these new facilities, the maybe expected increase to their business and the many other accruals, sort of overcame the thought of high cost.

The newness quickly wears off and then comes the utility bills with the regularity that only utility bills have. It is at this point that the owners decide there is really more to it than the original purchase price. It is at this moment too, that they usually become vitally interested in their equipment and it is here that the average Refrigeration Serviceman walks away—a most important part of his business—he fails to recognize the possibility of selling one of the most important commodities that he has for sales . . . "Service."

You have heard it referred to as Preventive Maintenance!

You may think the best time to sell preventive maintenance is when you are called out on a stuck pump on a cooling tower or when you have to correct some other difficulty.

Wrong Time To Sell Service Contract

That is the wrong time to try to sell Preventive Maintenance because in most cases the owner gets the idea that you are trying to take advantage of a situation . . . that you are trying to justify your charge. The owner is in trouble. He feels as though you have him over a barrel and while you have him down you are trying to sell him a Preventive Maintenance bill of goods.

Psychologically, that is the wrong time to try to sell Preventive Maintenance.

The time to sell Preventive Maintenance is when the owner is NOT having trouble—when you can sit down in the calm of his office or his store or his place of business and discuss the dollars and cents of operating and maintenance cost.

You can bring out the charts and the figures and the proof. At that time the owner has no reason to suspect you—no reason to look for the "gimmick" because there isn't any.

When you tell the owner of equipment that you have a plan to stabilize his current or power costs and to reduce or minimize the need for emergency repairs, then you offer that owner a proposition that he will be mighty interested in.

Prevention Is Important Selling Word

Having polio couldn't be any worse to the owner of large Refrigeration or Cooling equipment than to have breakdowns or increasing current costs. Why do people submit their children to vaccines and innoculations against disease? If you think Prevention isn't an important word then give a thought to what it might mean to you.

You must remember above all else that the owners of large Refrigeration and Cooling equipment are hard-headed businessmen—they know that for the same reason they maintain service on scales—computers—yes, even their automobiles or trucks . . . they would include important equipment like cooling, air conditioning, or refrigeration equipment if it were brought to their attention.

Few Owners Will Not Qualify

You can quickly determine whether owners maintain a regular service contract on other equipment . . . if so, then they are eligible for tackling on a Preventive Maintenance plan. There will be few owners of equipment who will not qualify for Preventive Maintenance.

Now stop and think for a moment—how much tonnage is there in your community—or better yet—add up the tonnage that you started up this past year.

In too many cases you had stuck pumps on cooling towers—you might even have had some broken pump shafts, burned out motors or have had to replace some other equipment before you could get the system started. When the owner got your bill do you think for a moment that it made him happy?

You may have made yourself some nice money but it came from owners who were not happy about paying you. That type of customer is more inclined to try some other Refrigeration Serviceman next time he is in trouble if only because he doesn't understand why he had the breakdown. You wait for the breakdown call or the starting up call and never try to sell any Preventive Maintenance.

Your stage is perfectly set if

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For more information about products advertised on this page use Information Center, page 66.

Preventive Maintenance--

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you will be the salesman . . . this doesn't mean you have to attend some school or clinic to find out how you go about it. It's as simple as when you went to the owner to tell him that it would be either tomorrow or day after tomorrow before you could get his system working.

Do this. Go over all the trouble jobs you had this spring —just take those as starters— then, one by one, visit the owners and talk to them about a plan that you have whereby the equipment will last longer—the current bills won't be as high as they have been—refrigeration and cooling will be more dependable.

Compare Plan To Protection on Other Types of Equipment

Show him by comparing the "Service Protection" he gives other equipment — his rolling stock is lubricated and oil changed — tires checked — he even carries collision insurance and certainly all the other varieties—fire, theft, windstorm—his office equipment is serviced periodically no doubt — you can make a mental listing of the various equipment the customer has that may be on a service contract of one sort or another and yet, here, his refrigeration cooling or air conditioning equipment—he trusts to luck that it will perform efficiently and that you are some sort of magician who can be called upon when it does breakdown.

Show him how delicate this equipment is, how other equipment, measured by any kind of ruler or yardstick he wants to use, is much less complicated. Show this customer exactly what is happening to his equipment—how scale may be forming in his condenser—how slime or algae is growing—you know the peculiar conditions of the water in your own locality.

You are selling the owner a service on a "so much" per year or "so much" per ton basis—a Preventive Maintenance program tailored to his particular equipment whereby you will maintain his equipment. You will clean it up for him to start with and properly maintain it during the season—put it to bed so to speak at season's-end and start it up for him at the beginning of the next season.

You will charge him so much for Preventive Maintenance service calls plus whatever Preventive Maintenance water treatment products you may have to use and plus any other materials.

This is something for you to sit down and figure out. There is nothing else that you could do to add income to your business and that would be greater or more important than to go out after Preventive Maintenance work but go after it with a definite plan.

I have another suggestion—that those of you who have been known as Refrigeration Servicemen, change your name. If you expect to sell merchandise and anyone can tell you that the way to make money is to sell merchandise—not labor—then you must give yourself a name that encourages people to think that you are the person they should buy merchandise from.

The name Refrigeration Serviceman ties you too directly to tools—to grease and oil and not enough to equipment and the sale of equipment.

For a new name I suggest Refrigeration and Cooling Dealer or Contractor or Refrigeration and Air Conditioning Dealer. You must get away from the reaction of the equipment owner—that "don't buy it from so and so Refrigeration Serviceman—because he only fixes the equipment."

The plumbing industry is a close parallel. That industry for years tried to popularize the words Master Plumber, but the public for too long a period associated a wrench, a piece of pipe, lots of mess, and a big bill with the name plumber—only because the plumbers did not associate themselves with things "merchandise" but with repair.

To capture some of the merchandising that the industry had been losing over the years, the national association changed the name from National Association of Master Plumbers to National Association of Plumbing Contractors. They are thinking of themselves in terms of dealers or contractors, the type of a firm that people who buy plumbing will go to in order to purchase merchandise. Owners know they can always call a plumber to fix it, but they want to go to a *dealer or contractor* to *purchase* equipment.

The Plumbing dealer has also embarked on a campaign to teach his journeymen plumbers how to look for opportunities to sell merchandise. He is teaching them to try to sell a new piece of merchandise before starting to make a repair.

He is even paying his journeymen plumbers a commission on the sale of products either birddogged or actually sold.

For more information about products advertised on this page use Information Center, page 66.

Tested Through 2 Summers

30 Packaged Air Conditioners Satisfactorily Cool 9-Story Bldg.

WASHINGTON, D. C. — A nine-story office building in the nation's capital that was air conditioned with 30 packaged air conditioning units has gone through two summers of operations with "the result satisfactory in every respect" reports Robert Levy of Lanier & Levy, Inc., consulting engineering firm of Washington and New York, and design engineer on the job.

Air Conditioned During Remodeling

The package units were installed during a remodeling of the building, which houses the American Automobile Association offices. The basement is also air conditioned, it was said.

The self-contained package units were selected for the air conditioning job "because they are particularly adaptable to an existing building," Levy states. He listed as other reasons for selecting the packaged units:

(1) lower first cost;

(2) the excellent flexibility obtained from the use of packaged units for zoning purposes;

(3) avoidance of the necessity of cutting the floors for piping and running chilled water mains in the basement, for which there is no room;

(4) since several of the zoned areas will be used frequently for special overtime work, it is economical to run a few packaged units for this purpose rather than run a large central refrigeration plant.

The total tonnage installed amounts to 215.5 tons for the 30 package units. A cooling tower doing the condensing work for all of the units is installed on the roof. Total conditioned area of the 9 stories and basement amounts to 70,350 sq. ft. which does not include corridors, toilets, or elevator spaces.

Each Ton Cools an Average of 350 Sq. Ft.

Average floor area per ton amounts to 350 sq. ft. The lighting load averages 2½ watts per square foot. Total circulated air averages 122 c.f.m. per 100 sq. ft., or 7.7 air changes per hour. This quantity includes 18.4 c.f.m. fresh air per 100 sq. ft. or 1.1 air changes per hour. Fresh air amounts to 15% of total circulated air.

The packaged units, varying in size from 5 to 10 tons, are grouped to cool areas with similar exposure. For the office floors, the distribution ducts run down the ceiling adjacent to the corridors, and are furred in.

Return air is taken from the various office spaces through grilles in the corridor doors and the corridor serves as a return air passage to each unit. Fresh air is brought separately to each air conditioning unit.

Ducts Covered with 1-In. Thick Insulation

Levy says that one of the features contributing most to satisfactory operation of the system was the insulating of the supply ducts with at least 1 in. of good duct covering, so that very little if any rise in temperature occurs between fan discharge at the unit and the most distant supply register.

It is Levy's view that a difference of 2 or 3 degrees in the temperature of the conditioned air at the supply register may make all the difference between a good air conditioning job and a poor air conditioning job.

Room Occupants Have Degree of Control

Ceiling height in the eight office floors is 9½ ft. Much consideration was given to the location and number of supply registers. All registers have "San-trols" back of each register, adjustable double deflection vanes, and manual volume control.

"This gives the occupants of each room some manual control, and it makes them happy if they can do a little adjustment on their own," Levy declares.

Pump for the cooling tower has a 20-hp. motor, and circulates 650 g.p.m. at 86-ft. head with a 10° F. drop. The pump is controlled so that it stops operations when the last air conditioning unit is cut off, and starts when the first air conditioning unit is started.

One aim in the design for the installation was to provide controls that would be adequate, but kept as simple as possible. The control of cooling in the various zones is accomplished with the use of the built-in thermostat of each unit which is in the return air stream.

The possibility of using time clocks for starting and stopping the operation of the units was considered, but was discarded because of the irregularity with which the various conditioned spaces were to be used.

Units Turned Off by Someone In Each Dept.

The building operator turns on all units in the morning, and one person in each zone turns off the particular unit operating in that zone when the particular department operating in that zone quit work. During operating hours the fans for all units run continuously.

The building is served by a heating system that consists of one pipe steam to each room. Since this was satisfactory, it was not changed, with the exception of the basement and first floor. Units for these floors have been equipped with non-freeze steam coils to be used for heating as well as cooling, with separate heating controls.

Cost for installing this air conditioning system was approximately $400 a ton of cooling capacity.

For more information about products advertised on this page use Information Center, page 66.

Church Saves $2,000 a Year In Electricity Costs Using 10-Hp. Compressor with Flexible Ice Storage Conditioning System

CHICAGO — The advantages of the "ice accumulation" system for use in certain air conditioning applications, and some of the factors involved in the various applications, were described by A. P. Boehmer of the Dole Refrigerating Co. before a recent meeting of the Chicago section, American Society of Refrigerating Engineers.

The particular advantage of the ice storage system is in applications where there is a problem of peak loads, such as in church air conditioning. Here the air conditioning electrical current cost is based on demand.

Smaller Condensing Units Reduce Demand Charges

The advantages in using smaller condensing units, as is possible with ice storage systems, are reflected in reduced demand charges. For instance, a typical installation that has a peak requirement of 50 tons refrigeration for a two or three hour period on Sunday can be handled by a 7½ or 10-hp. compressor.

In checking with the demand charges by the Chicago utility, Boehmer found that the 50-hp. compressor was charged $85.50 for a month of use, while on the other hand charge for a 10-hp. compressor running over a longer length of time was only $9.50. In dollars and cents one church saved $2,000 a year, Boehmer declared.

Refrigeration Can Be Diverted Room to Room

The ice cell system is flexible. The refrigeration can be diverted for early morning use into the Sunday school rooms and later switched to the main church area for the late morning services.

In operation, the compressor is started about 5:30 p.m. on Saturday. By 8:30 a.m. Sunday the thermostat is set to precool the church for occupants arriving at 9:00 a.m. By operation of the church thermostat a circulating pump starts and 45° F. water is passed through the church cooling coil.

By-Pass Valve Mixes 45°—53° Water

The water returns to the ice cell at 53° F.; the 32° F. water leaving the ice cell is mixed with the 53° F. water through the by-pass valve to maintain the 45° F. supply. For automatic humidity control the by-pass valve can be automatically controlled for any supply temperature in a wide range.

At about 9 a.m. the Sunday school thermostat is set starting another circulating pump. The same temperature water entering the church also enters the Sunday school unit. If independent control of humidity is wanted in the Sunday school it can be arranged. However, from a practical viewpoint the humidity control is not as important as the temperature control. As a matter of fact, the by-pass valve could be a manual valve set for average humidity conditions.

At 12 p.m. the cooling thermostats are turned off until the next occupancy load. For the gathering on Sunday evening once again the thermostat is set and the system controls are room conditioned.

While the thermostats control operations of the pumps the condensing unit is controlled by an ice bank controller. The compressor, therefore, is rather independent of fluctuating loads. Generally an ice bank is held all week because of use of some of the facilities during the week.

In motel applications the peak hours are from 4 p.m. to 9 p.m. The ice cells have enough time to build up during the morning.

Some motel owners, Boehmer said, were more willing to pay for a pipe to pump water to the system than the ducts needed for a conventional type system.

Boehmer pointed out that the ice storage system of air conditioning has obvious advantages for funeral homes, and as a booster for bowling alleys and restaurants. Other applications can be made, he said, but the specific requirements being that a peak load must exist for relatively short periods with adequate time between peaks for ice storage build up.

Firm Names Chapman

GLENDALE, Calif. — Charles V. Chapman has been named field representative for the Atlanta branch of General Controls Co., according to J. F. Ray, the firm's vice president in charge of sales.

40-Ton Roof Unit Adapted for Exposure Solves 5 & 10's Air Conditioning Problem

TOLEDO—When the F. W. Woolworth Co. wanted to air condition its store at 1012 Sylvania Ave. here but could not provide any interior space for the equipment, J. J. Jefferson, superintendent of construction for Woolworth, and Bob Greenwald, manager of the air conditioning division of Lumm Corp., local contractor, decided to use space on the roof.

Decision To Condition Accompanied Expansion

Fortunately, the decision to air condition accompanied an expansion of the store. This permitted management to specify roof beams in the one-story addition that would be strong enough to hold the apparatus necessary to produce 40 tons of refrigeration.

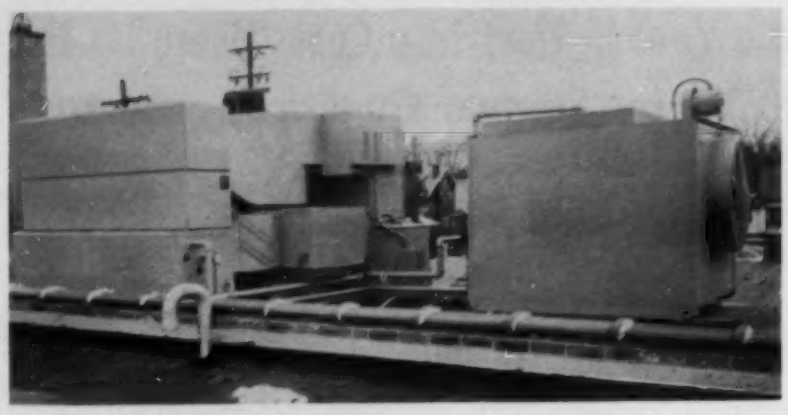
For this job, Greenwald installed two standard Worthington self-contained 20-ton packaged air conditioning units and adapted them for outdoor exposure. He also installed a Marley "Aquatower" and a Worthington circulating pump.

All supply and return air ducts exposed to the elements were insulated with 2 in. of Fiberglas and then coated with a waterproof membrane. On top of this was applied a thick coat of mastic. Then it was painted with a couple of coats of grey rustoleum to improve the appearance and durability.

Thus protected, the equipment has performed as efficiently as though it were housed indoors, Greenwald asserted.

The units and the cooling tower were also painted in grey rustoleum for appearance' sake, he declared. He noted that it wasn't necessary to do this but added that his policy is to give the customer the best job for the money.

Greenwald commented that he is careful about the appearance of his installations, even when they are put in such out of the way places for a number of reasons.



ABOVE: View (and at left from another angle) of two self-contained 20-ton packaged air conditioning units and Marley "Aquatower" installed on roof of F. W. Woolworth store in Toledo. All exposed units are insulated against the elements by 2 in. of Fiberglas and coated with waterproof membrane.

Customer Gets Extra Pride In Equipment

One is that it gives the customer an extra sense of pride in his equipment and convinces him that he is getting his money's worth. Another is that Greenwald likes to use previous installations to help sell other prospects and a neat, clean attractive job is a convincing advertisement of the quality of work performed.

When we bid on a job, Greenwold said, we always include a certain percentage for contingencies that may arise during installation. If the job goes smoothly and the contingency money is not spent, we will invest it in painting up the equipment or even polishing and lacquering the copper tubing.

"This takes the installation man only a few more hours of work," he said, "and it pays off handsomely in helping to sell other jobs."

Nashville Firm Plans New Air Conditioning Plant In Suburb

NASHVILLE, Tenn.—Central Air Conditioning & Heating, Inc., of which W. E. McLeod is president, has announced plans for building a new plant in Sidco subdivision.

Central is moving from leased quarters at 924 Eighth Ave., S., where it has offices and shops. It has been leasing warehouse space in other parts of the city, according to McLeod.

He said the new steel and masonry building will have 11,000 sq. ft. initially, with provisions for addition of 3,000 more in about 18 months.

The building will include offices, display, shops, and warehouse space for Central, and all facilities for Central Distributors, a wholesale warehousing subsidiary of central and middle Tennessee distributor for Chrysler Airtemp products, he explained.

For more information about products advertised on this page use Information Center, page 66.

GROW BIGGER WITH

bryant

HERE'S ONE WAY YOU CAN
GROW BIGGER WITH

bryant

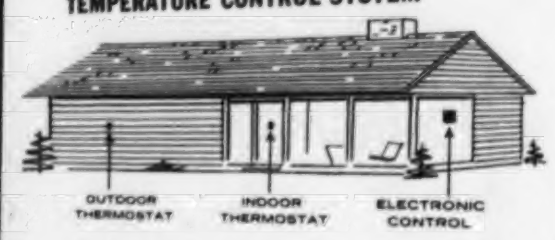
THE MOST TERRIFIC COOLING PROMOTION EVER OFFERED!

GIVE YOUR CUSTOMERS
ABSOLUTELY FREE

$225.00
in electronic
home comfort
CONTROLS

LIMITED TIME ONLY

YOU GIVE YOUR CUSTOMERS THE FAMOUS
HONEYWELL ELECTRONIC MODUFLOW
TEMPERATURE CONTROL SYSTEM



COMPLETE YEAR 'ROUND HOME COMFORT
regardless of temperatures outside. Your customers have read about this system in Life and other national magazines.

OFFER YOUR CUSTOMERS EITHER:

1. No payments 'til cooling season, or
2. No money down — 36 months to pay

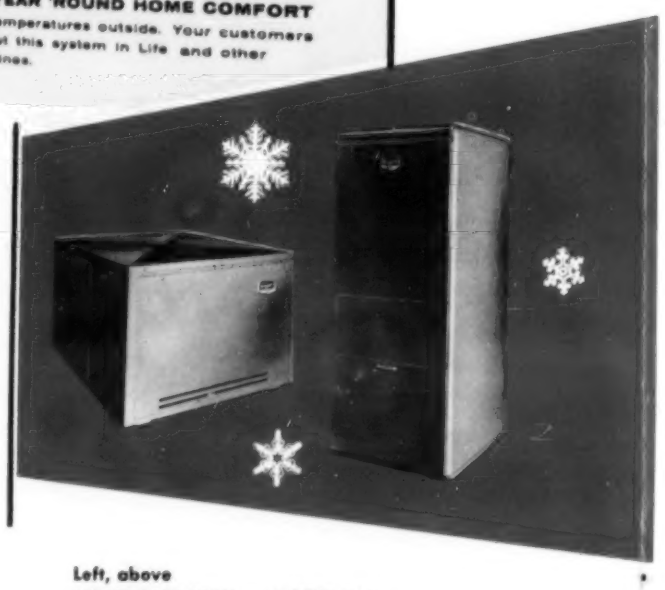
FOR FULL DETAILS CALL YOUR BRYANT DISTRIBUTOR TODAY!

and here are 8 more reasons why

you'll grow bigger with BRYANT . . .

1. Your customers know and trust the name Bryant . . . famous for 47 years as the leading name in home comfort.
2. From small home to mansion there's a Bryant to fit the budget and the need in gas or oil furnaces, boilers, air conditioners, space heaters, unit heaters, water heaters.
3. You build customer confidence when you install Bryant . . . the highest quality home comfort equipment built.
4. You profit more with Bryant because of the Bryant dealer development program, the most complete in the industry.
5. You get sales building tools that increase sales and profits.
6. You have the help of a nearby Bryant distributor who gives you complete engineering, sales and service help.
7. You are backed by powerful national advertising.
8. You get complete co-op advertising to build sales in your own community.

Don't miss this tremendous cooling promotion. It's a complete package that will bring prospects for home cooling to *YOU*. For the name and address of your Bryant distributor write, Bryant, 48 Monument Circle, Indianapolis 4, Indiana.



Left, above
AIR COOLED UNIT — MODEL 560
No worry over water restrictions or high water rates. Brings clean, cool, healthful indoor weather no matter what outside temperatures are.

Right, above
"COMMAND-AIRE" TWIN UNIT — MODEL 590
The model that puts complete home air conditioning within the reach of every homeowner. Cools, dehumidifies, filters and circulates the air.

BE MR. B IN YOUR COMMUNITY
AND GROW BIGGER WITH BRYANT

bryant

7 Year-Round Packaged Units Condition Large Printing Plant Without Ductwork

GREENSBURG, Pa.—One of the largest and most completely equipped independent printers in western Pennsylvania, the Charles M. Henry Printing Co. here, has recently furnished its one-story plant with 40 tons of air conditioning.

Seven packaged Typhoon air conditioning units are used without ductwork to serve a total floor area of 22,000 sq. ft.

Five 5-ton units are located in the letterpress printing and composing room. Two 7½-ton units equipped with extra coils and double blowers for high humidity removal capacity stand in the offset press room.

5-Ton Units Face Alternate Directions

The five 5-ton units serving printing and composing room are situated along a row of supporting pillars which divides the room in half, with their air intakes facing in alternate directions for optimum recirculation.

The units are equipped with four-way plenums, to distribute cooled air evenly throughout the entire area. Separate automatic "Zone-Control" thermostats cycle each unit only when cooling or heating is required in its own "zone."

In the offset room, the two Typhoon "94's" serve to check a serious problem that often arises in the course of offset printing.

In humid weather, sheets of paper stored for offset use tend to pick up moisture at their edges and lose their dimensional stability. The edges will swell and form ripples, so that a sheet will actually measure longer at an edge than across the center.

These ripples make it necessary to dry the paper carefully before feeding it into the offset press, and can be especially serious in the case of multicolor runs, where precise register is imperative.

Humidity Control Minimizes Paper Rippling Problem

Special humidity control, such as that provided by the Typhoon "94's," serves to reduce this problem to a minimum.

Humidity control is important to still another phase of offset printing, since the "image" or picture area of the offset plate must be kept free of moisture in order to pick up ink and transfer it cleanly to the rubber blanket, which in turn offsets the ink onto the paper.

In very humid weather, the image areas may pick up unwanted moisture from the air. The image areas then repel ink applied to them. The result is imperfect or blotchy printing.

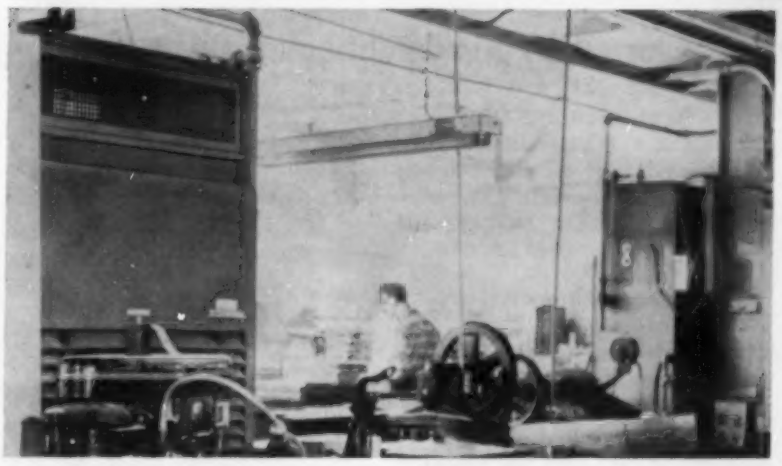
The cooling system with its high dehumidification capacity, serves also to minimize this problem.

All seven Typhoon packaged units in the Charles M. Henry Printing Co. are equipped with heating coils. They are connected to an existing steam boiler in the basement to furnish year-round air conditioning.

Installation of these heating coils eliminated bulky steam pipes which had formerly surrounded the working areas, and added valuable space for additional printing facilities.

William Henry, president, reports that his employes are very pleased with the installation of air conditioning, and that there is less absenteeism and on-the-job fatigue than before. The firm's production quotient maintains a high level, he says, even during the hottest weather.

The installation was made by Brandstetter & Co., Typhoon dealer in Greensburg.



PRINTING and offset press room of Charles M. Henry Printing Co., Greensburg, Pa., is air conditioned by seven self-contained Typhoon units producing 40-tons of refrigerated air to service the 22,000-sq. ft. working area. To maintain printing standards, it was necessary to eliminate circulating dust particles and have precision control of humidity and temperature.

New Brunner Plant In Canada Produces Hermetic Unit Line

PORT HOPE, Ont., Can.—The Brunner Corp. (Canada) Ltd. has announced that a new building is being added to its factory here.

The company said the plant extension is necessary to enable it to produce a complete line of hermetically-sealed condensing units, from ¼ to 7½ hp. The firm is already producing open-type belt-driven compressors of ¼ to 100 hp.—"a complete range of sizes not previously available in Canada."

The new cement-block building, now under construction, is expected to be in full production by May 1. "It provides much-needed space for mass production of the company's products, with modern machinery."

Some of the Benefits Reported by Air Conditioning Owners

Of the homeowners surveyed, 40% responded and here are some of the results shown in percentages based on the 40% response figure:

63% reported improved appetites among individual members of family.

75% serve more hot meals in summer.

58% reported an improvement in dispositions of individual members of family.

43% reported they have more recreation time on their hands.

63% reported they have more energy.

65% reported improvement in general health of family.

40% say they suffer from fewer colds than before.

48% reported less suffering from allergies, asthma, and sinus conditions. (One homeowner commented that air conditioned living helped alleviate hay fever suffering; another said it eliminated prickly heat).

48% reported they now spend their vacations at home. One family reported they now take a winter vacation; another family said they have an air conditioner in their summer home; and another family said the children keep them at home.

65% reported dusting time definitely cut down from daily to weekly, and from daily to only two or three times per week.

75% reported street noises less noticeable.

"Spend more time at home now instead of going to other air conditioned places."

40% reported use of vacuum cleaner changed from bi-weekly to weekly and from weekly to every two or three weeks.

One family reported a $50 a year saving in rug cleaning; three families reported they saved on drapery and slipcover cleaning—one saved $50; another $15; and the third, $60. One family reported they saved $100 on cleaning of clothes.

In connection with general saving in cleaning bills, some families had the following to say:

"Have been in our new home one year and have no rug or drapery cleaning expense."

"Less maid help because there's not so much dust."

"Since we had air conditioning, one cleaning a year for rug and draperies is sufficient."

Direct Testimony

About How Air Conditioning Has Improved the Health and Happiness of Those Who Have It

HARRISON, N. J.—A survey recently conducted by Worthington Corp. discloses that people living in air conditioned homes feel better, sleep better, and have more time and energy to spare.

Worthington queried a cross-section of homeowners in whose homes a Worthington residential year-round unit was installed, with the purpose of discovering what added benefits air conditioned living has to offer.

The homeowners surveyed reside in 23 of the 48 states—Alabama, Arizona, Arkansas, Delaware, District of Columbia, Florida, Georgia, Illinois, Indiana, Iowa, Kentucky, Mississippi, Missouri, Nebraska, New Jersey, New York, Oklahoma, Pennsylvania, Tennessee, Texas, Utah, Virginia, and Washington—representing a comprehensive cross-section of the country.

(A tabulation of some of the principal benefits reported by these users of air conditioning is presented in the columns at the left of this page.)

Additional comments volunteered by homeowners:

"Restful nights result in more profitable results from daily effort for employer."

"More efficient house management."

"Air conditioning has definitely contributed to recovery of wife who was ill."

"Frankly, we have more company. So far, I haven't decided whether this is good or bad. We wouldn't be without it at any rate!"

Operating costs, of course, varied considerably, depending upon location, type and size of home, shading, insulation, number of hours unit was operating, etc.

These are the average operating costs for cooling per year indicated by the answers in the survey:

Southwestern area, $137.75; southern area, $73.33; southeastern area, $119; eastern area, $87.50; central area, $93; and western area, $87.50.

Hollmeyer In Dravo Cincinnati Sales Post

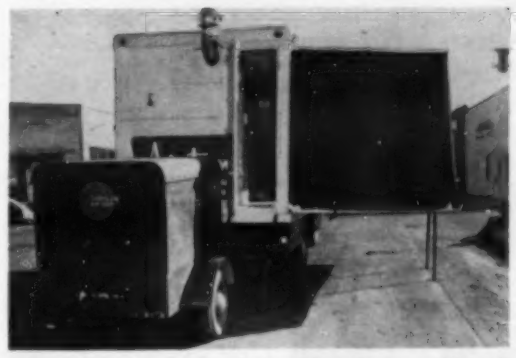
PITTSBURGH — Richard J. Hollmeyer has been named a Cincinnati district sales engineer for Dravo Corp. here.

Hollmeyer will handle the sale of Dravo's complete line of industrial and commercial warm air space heaters and crane cab conditioners in southern Ohio, Kentucky, and southern Indiana.

Hollmeyer, has had a number of years' experience in the heating field.

For more information about products advertised on this page use Information Center, page 66.

'Show Boat' Travels To Train Dealers With 'Live' Heating, Air Conditioning



AS PICTURED, the side of the "Show Boat on Wheels" extends to form an auditorium large enough to accommodate 16 dealers in training sessions.

SIDE VIEW of the "Show Boat" shows the fully equipped heating and air conditioning mobile classroom.

BIRMINGHAM, Ala. — Airtemp dealers throughout Alabama and northwest Florida no longer have to "go to school." The school now "travels to them."

Steel City Supply Co., Birmingham, Airtemp air conditioning and heating distributor for this area, has inaugurated a novel, mobile school and display —appropriately titled, in good southern tradition, the "Show Boat On Wheels."

The "Show Boat" carries "live" heating and air conditioning units to the dealer's door, where three-hour training sessions are held on product features and installation and service techniques.

Already well traveled, the Show Boat during the past few weeks has played to maximum dealer audiences in more than a dozen southern cities, including, to cite a few, Pensacola, Fla.; Montgomery, Auburn, Troy, and Mobile, Ala.

Side Drops To Form Auditorium

One of its many features, the mobile school carries its own classroom. The entire right side of the truck body is piano-hinged at the bottom. This lets down to form a platform, or auditorium, where up to 16 people can be seated.

An inner flap, hinged at the top of the body, swings up to form a rainproof roof. Canvas curtains are then wrapped around the body of the extension and the classroom is ready for use.

Lo-Boy LP Gas Furnace, 2-Hp. Condensing Unit Used

Show Boat Airtemp equipment includes a Lo-Boy LP gas furnace, selected because of head room limitations within the truck body; and a 2-hp. waterless condensing unit connected with a "V" type cooling coil mounted on the top of the furnace.

This equipment is fully operative. With it dealers are shown how to install liquid and suction lines; furnace power supply; wiring to the condensing unit, and thermostat wiring.

Suction, head, pressure, and oil gauges are installed, as well as necessary thermometers, so that dealers and servicemen can learn how to take complete check, test, and start readings. For additional dealer information, there are mock-ups of service entrance panels and rain-type disconnect switches.

A vertical fan-coil unit and 2-hp. commercial water-cooled "packaged" air conditioner are also aboard, but, though used for instruction purposes, they are non-operative.

Furnace fuel comes from two liquidified petroleum gas bottles concealed in the outer body skirt beneath the truck. A five kilowatt automatic Kohler 115-230 volt a.c. generator is mounted on a two-wheel trailer and towed behind the Show Boat. From either this source or from a range outlet in the dealer's store, current is supplied for the fluorescent lighting and the operation of the equipment on display.

The entire unit was designed by Bob Hall, president of Steel City Supply, and Elliott Higgins, engineer and manager of the firm's Heating & Air Conditioning Div. Following their original design, another nationally-known company has purchased a duplicate of the Show Boat and placed three more on order.

Steel City Supply officials comment that in the past only moderate success was obtained in attracting dealers to Birmingham for training schools and sales presentations.

By contrast, the Show Boat has been eminently successful. Every scheduled presentation has played to a full house of very interested dealers and servicemen.

The management of Steel City feels that the employment of the Show Boat for product and installation training will greatly increase sales during the coming year. At the same time, it is expected that there will be an increased number of orders and decreased number of service complaints for the distributor.

They'll Do It Every Time

by Jimmy Hatlo

Historical Lesson for Air Conditioning Promoters

(Concluded from Page 1)

resounding crash, or leave quietly by the back door—truly is appalling.

Veterans who remember the vicissitudes of our industry since 'way back when, aver that early pioneers were composed of:

(1) Opportunists who saw a chance to sell stock on the basis of an exceptionally favorable response to the idea of electric refrigeration and air conditioning;

(2) Inventors and entrepreneurs who really could provide products which would perform a useful and valuable service in the home, and

(3) Local dealers and wholesalers who hoped to build permanent business institutions thereon.

Two premises stand out in a study of this historical material:

(a, Our American public accepted the idea of automatic refrigeration and air conditioning early, and regarded it with increasing favor as the years went on—so much so that it bought not only refrigerated products, but reams of stock in companies which manufactured them; and

(b) Once a man fell into the air conditioning and refrigeration industry, by accident or by design, he found it hard to tear himself loose from it.

Over and over again in the record appear the same names. When one company passed out, its best men found berths in other concerns. Many of them had such faith in the future of the industry that they were able to sell established manufacturers of other lines on the idea of getting into the cooling business.

The lot of the pioneer almost invariably is a thankless one. Seldom does the originator of a new service to humanity live to reap profits from the seeds he has sown. Notably that axiom has held true in the air conditioning and refrigeration industry. It should be remembered, though, that what an inventor does is only one part of a pioneering job.

The function of the promoter who stirs the imagination of investors is equally important. Few inventors have the ability to attract the capital which is ordinarily required to float a successful enterprise. Many promoters, on the other hand, don't understand in detail the product they are offering, or realize its full significance. They live on, and trade on, faith and inspiration. They do their part, and it is a necessary one (even if their methods are sometimes questioned) in the development of an industry.

The perfection of a working model of an invention, and the collection of money enough to launch an enterprise, are not sufficient in themselves. Competence in production processes—knowing how to manufacture economically in quantity—is essential to the success of a company.

Likewise, *good distribution.*

The salesman who goes out to call on "cold" prospects—those who have never heard of the product and are not conscious that they need or want it—is equally as much a pioneer as the man who first conceived the product idea. So are those who organize and manage a distributing organization, and promote the business.

Notwithstanding all the early failures in our industry, those who are riding the crest today have reason to offer up a few toasts to the trail-blazers who broke through the underbrush of inertia and indifference. And while we are thanksgiving, it might be well to drop a flower of gratitude on the graves of those investors who lost, collectively, millions of dollars in early experiments. Expensive though these lessons may have been, yesterday's losses form the foundation for today's gains.

Air Conditioning and refrigeration—thanks to patiently invested time and money by men who have devoted their lifetimes to the industry—are ready to reap a harvest.

> The difference between a trade and a profession is that the trader frankly carries on his business primarily for the sake of pecuniary gain, while the members of a profession profess an art, their skill in which they place at the public service for a remuneration, adequate or inadequate, but which is truly an end in itself. The professional man finds his rewards in his sense of mastery of his subject, in the absorbing interest in the pursuit of knowledge for its own sake, and in the contributions which, by reason of his attainments, he can make to the promotion of the general welfare.—JAMES BRYANT CONANT.

AN INTERNATIONAL INSTITUTION • SUBSCRIBERS ALL OVER THE WORLD

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AIR CONDITIONING & REFRIGERATION NEWS

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F. M. COCKRELL, *Founder*

'The Conscience of the Industry'

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OFF THE CHEST

F. H. Langsenkamp Co.
Indianapolis 25, Ind.

Editor:

I am sorry that time and events move so swiftly that I did not write you before now, and add to the many thousands of letters you received.

George, we in the whole industry realize that you and your publication are responsible for the fine associations of wholesalers and manufacturers operating in the industry today. If it were not for George Taubeneck I truthfully feel that refrigeration and air conditioning would be some years away from its present spot in the sun. All of us owe you a great debt of gratitude.

F. S. LANGSENKAMP,
President

H. A. Pendergraph Co.
Atlanta 9, Ga.

Editor:

Honestly it doesn't seem like a quarter of a century since you began making and recording a lot of history about one of this country's great industries. Both of us can remember when it was an infant industry—and I mean the refrigeration part of it—not ing part of it.

When I read about the tribute paid you at an Industry Dinner on Feb. 8 celebrating your 25 years as Editor of the NEWS, I could not help recalling what must have been one of your first assignments when you became associated with that publication. We were drawing a good deal of attention at that time at the Georgia Power Co. with some early merchandising methods on introducing what then was a practically unknown product. We and others of that day perhaps inspired you to write "One Foot in the Door," which I still have in my office.

Congratulations to you, George, and may the years ahead continue to be good to you. You have made a proud record of success in all the better meanings of that word and I am delighted to add my greetings on this fine occasion.

H. A. PENDERGRAPH..

The Coleman Co., Inc.
Wichita 1, Kan.

Editor:

I have never seen any other trade paper editor so widely recognized by an industry. It was a wonderful testimonial, not only to George, but to all of you who have worked to make the NEWS so important.

JACK KICE,
Manager

Drying 'F-22' Systems—

There Are Special Measures To Be Observed In Using Vacuum Pump and Other Procedures

ATLANTIC CITY, N. J.— Suggestions for drying refrigeration systems, particularly those employing "Freon-22" or "Genetron-141," based on the experiences of his company, were offered before the Refrigeration Service Engineers Society by John H. Spence, service manager, Hussmann Refrigerator Co.

"The more we learn about drying 'F-22' systems, the less we know," Spence commented at the RSES 18th annual convention here.

Sizing the Lines

He pointed out, however, that Hussmann has been successfully using "Freon-22" for more than five years in the field.

"Sure, we've had problems, as does any pioneer," Spence said, "problems such as getting proper line sizes, which must be reduced under 'Freon-12' lines to get increased velocity, and the problems presented by the introduction of commercial type hermetics of ¾ hp. and above."

Effect on Motor Windings

In hermetics where the suction gas cools the motor windings, "it is reasonable to believe there is some movement of the motor windings as they are alternately cooled by the refrigerant and then allowed to warm up," Spence declared.

"This movement may wear insulation on the windings, which can be attacked if any moisture is in the system," he indicated.

It was also said by Spence that "no one knows the maximum permissable tolerance of moisture in 'F-22.' Some experts give the opinion of 60 parts per million.

Use a Vacuum Pump Designed for Job

"Although there are many methods of drying systems, we believe the quickest and the best way is to use a vacuum pump—a vacuum pump designed for that purpose, not just a converted refrigeration compressor," he emphasized.

"A vacuum pump of 2 c.f.m. capacity with a ⅓-hp. motor is adequate for most food store jobs," Spence believes.

"If oil in the vacuum pump becomes contaminated with moisture, the oil must be changed. And you must use an oil supplied specifically for a vacuum pump," he warned. "Ordinary oil won't do."

Spence pointed out, too, that a "gas ballast" feature on some vacuum pumps prevents condensation and thus prolongs the life of the oil.

To Check the Vacuum

To check the vacuum on a system during evacuation the ordinary compound gauge is not accurate enough, according to Spence. Instead, he suggests using a vacuum or moisture indicator consisting of a wet-bulb thermometer inside a sealed test tube containing moisture. Such indicators, he said, are commercially available.

For breaking the vacuum on the system, dry nitrogen or "Freon" piped through a dryer can be employed, Spence declared.

"We prefer to use the triple evacuation method, evacuating the system three times," he revealed.

Make Use of a Drier After Evacuation

"Even after triple evacuation it's still possible to have moisture in the motor windings and the pores of compressor castings," he warned. "Therefore, you should use a drier recommended by the equipment manufacturer to pick up what moisture remains after evacuation.

"Even proper drying of the system," Spence cautioned, "won't cure other ills due to faulty installation, restrictions in the lines, etc.

"Our records, however, show that generally we're having less trouble with 'Freon-22' systems than with 'Freon-12.'"

Oil Breakdown Point Affected by Moisture

Discussing the effects of moisture in a system on oil, he commented, "the breakdown point of oil in a dry system is at least 500° F. If the compressor is working perfectly, you won't get temperatures higher than 250° F. But moisture in the system greatly reduces the oil breakdown point."

Condition of the oil in a system should be checked from time to time, Spence believes, by removing a little from the crankcase and comparing this sample with fresh oil.

Such checks are especially important on low temperature systems, Spence believes.

Cochrane Co. Subsidiary Established In Canada

PHILADELPHIA — Cochrane Water Conditioning, Ltd. has assumed engineering, manufacturing, and sales activities in Canada as a subsidiary of Cochrane Corp. here.

Through a mutually agreeable arrangement, Canadian General Electric Co., Ltd., representative of Cochrane Corp., ceased its activities as representative Dec. 31, 1955.

General offices of Cochrane Water Conditioning, Ltd. are at 940 Lansdowne Ave., Toronto, under Murray Dobier, vice president and general manager; V. C. German, sales manager; and J. F. Hayward, sales engineer.

R. G. Riddell, sales engineer, will be in charge of a district office at 1010 Beaver Hall Hill, Montreal, Que. Representative in British Columbia is C. C. Moore & Co., Vancouver, B. C.

Everyone on the team benefits from Copel

WHOLESALERS...vital link to 20,000 sales-conscious dealers.

That's the reason why Copeland wholesalers can and do carry field stocks of units and compressors totaling over $3,500,000.00! They are sure of profitable turnover . . . the demand for the wide Copeland line is continually growing. With 20,000 dealers serving every phase of an ever-widening market for refrigeration and air conditioning, 128 merchandising Copeland wholesalers are ready to deliver new or replacement equipment on short notice.

MANUFACTURERS . . . . are sure of continuing customer goodwill!

Copeland wholesalers make up an unequalled network of 128 suppliers who specialize in refrigeration. Each carries sufficient stocks of all Copeland product items, and, each is the recognized leading wholesaler in his area.

These outstanding wholesalers back up your product with an average experience record of 10 years with Copeland! Now over 500 manufacturers of display cases, coolers, air conditioners and other products are sure that in-or-out-of-warranty service requirements are being met promptly.

List at the right shows the strategic locations of Copeland wholesalers where only the very best in refrigeration supply service is provided.

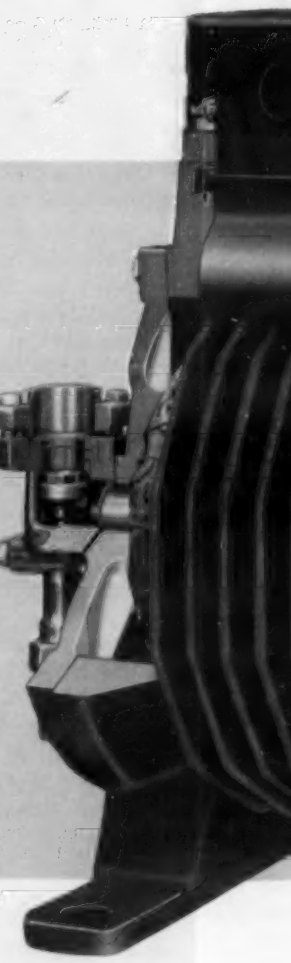
For room and packaged air conditioning . . . COPELAND gives you a

Copelaweld

Copeland engineering packs whisper-quiet power into this heavy-duty, welded motor-compressor. Up to 10% more capacity than similar types plus low current consumption make it ideal for packaged air conditioners and many other applications. Freon-12 in ½, ¾ and 1 H.P. models; ½, ¾, 1 and 1½ H.P. using Freon-22.

Copelametic

Copeland gave the industry its first accessible hermetic combining positive performance, operating economy, on-the-spot serviceability. Copelametic is tops for quiet, rugged dependability. Suction-cooled COPELAMETIC motor-compressors using Freon-12 in 2, 3, 5, 7½ H.P. . . . with Freon-22 in 3, 7½, 10 H.P. Smaler sizes air-cooled and water-cooled available.



COPELAND also builds a complete line of air-cooled and water-cooled, belt-driven units in sizes through 7½ H.P.

SINCE 1918

Copeland
REFRIGERATION CORPO

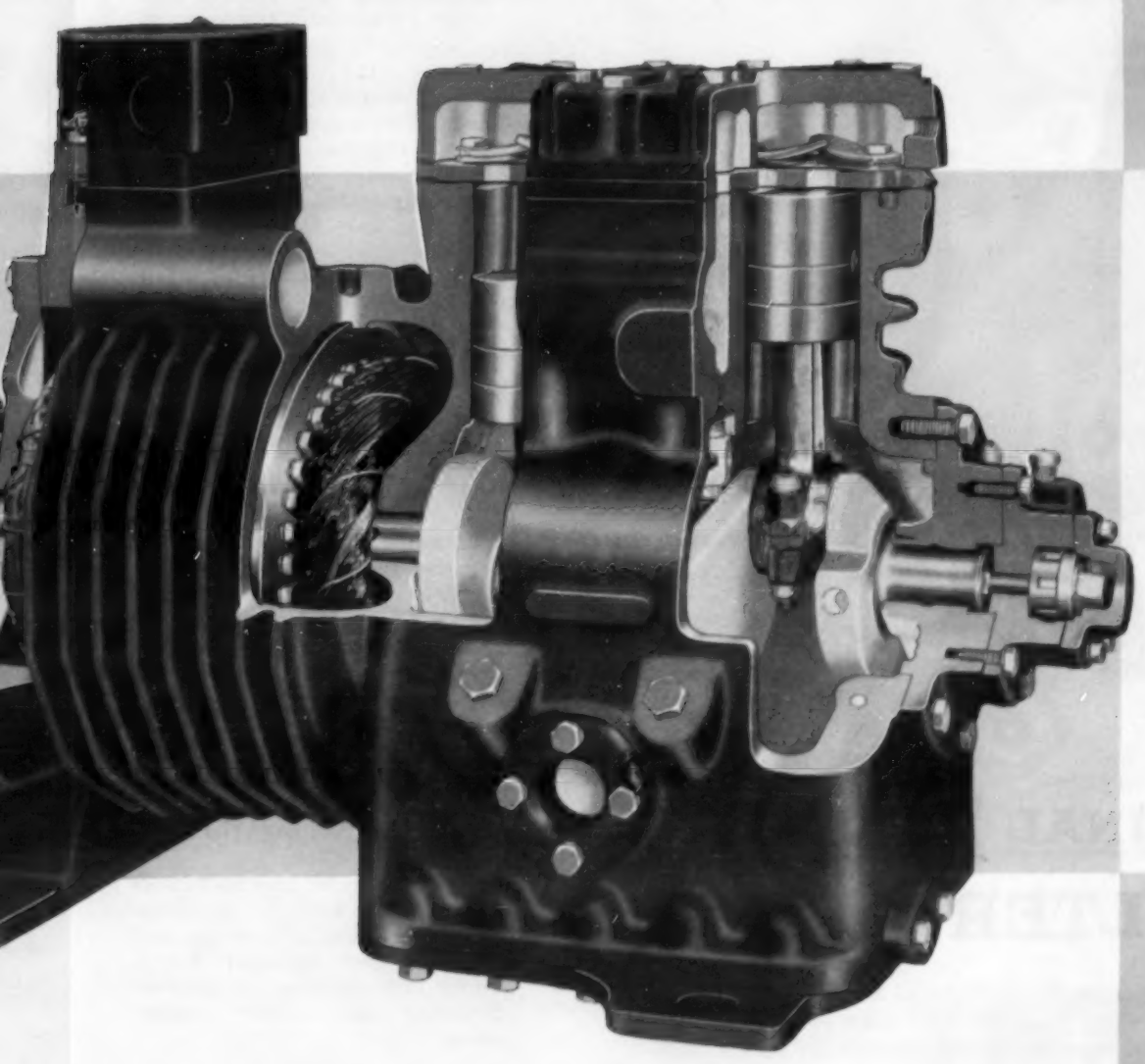
For more information about products advertised on this page use Information Center, page 66.

opeland distribution policy

DEALERS . . . . with lower investment can give better, faster service.

Copeland's wide wholesaler coverage eliminates the need for a larger dealer inventory investment. Whatever the application . . . air or water . . . single or three-phase . . . high, commercial or low temperatures, Copeland units, motor-compressors and replacement parts are immediately available from wholesaler stocks. Backed up with a sound, sensible service plan, a dealer can level his sights in increasing sales with confidence that his customers are assured continuing satisfaction.

you a choice of motor-compressors.



RPORATION, Sidney, Ohio

128 ALERT COPELAND WHOLESALERS back up the manufacturer and some 20,000 dealers and service organizations. They are there with the goods when you need them. In a matter of hours . . . or even minutes . . . you can get a complete unit, a motor-compressor or a small part. That's Copeland on-the-spot service!

ALABAMA
Refrigeration Supplies Distributor, Birmingham, Alabama
Hand Supply Company, Dothan, Alabama
Harris Supply Company, Mobile, Alabama
Nolin-McInnis, Inc., Montgomery, Alabama

ARIZONA
Hermetic Refrigeration Company, Phoenix, Arizona

ARKANSAS
Central Supply Company, Fort Smith, Arkansas
Refrigeration & Electric Supply Co., Little Rock, Arkansas
Interstate Electric Co. of Shreveport, Inc., Texarkana, Arkansas

CALIFORNIA
Pacific Metals Co., Ltd., Los Angeles, California
San Francisco, California

CANADA
Railway & Eng. Specialties, Ltd., Montreal, Quebec, Canada
Toronto, Ontario, Canada
Winnipeg, Manitoba, Canada
Refrigerative Supply, Ltd., Vancouver, B. C., Canada

COLORADO
McCombs Refrigeration Supply Co., Denver, Colorado

WASHINGTON, D. C.
Melchior, Armstrong, Dessau Co., Washington, D. C.

FLORIDA
Refrigeration Supply Company, Jacksonville, Florida
Berner-Pease, Miami, Florida
Graves Refrigeration Company, Miami, Florida
Orlando Refrig. Supply, Inc., Orlando, Florida
Capital Refrigeration Supply Inc., Tallahassee, Florida
Graves Bros. Refgn. Supplies, Inc., Tampa, Florida
Motor Parts & Equipment Co., Inc., West Palm Beach, Florida

GEORGIA
Graves Refrigeration, Inc., Albany, Georgia
Augusta, Georgia
Graves Refrigeration Company, Atlanta, Georgia
Graves Supply Company, Columbus, Georgia
Graves Supply Co. of Macon, Macon, Georgia
Savannah Refrigeration Supply, Savannah, Georgia

ILLINOIS
Chase Supply Company, Chicago, Illinois
Refrigeration Supply Jobbers, Chicago, Illinois
Service Parts Company, Melrose Park, Illinois
Polar Supply Corporation, Peoria, Illinois
Gustave A. Larson Company, Rockford, Illinois
United States Electric Co., Inc., Springfield, Illinois
Rogers Refrigeration Supply Co., Urbana, Illinois

INDIANA
Budlock Refrigeration Supply Co., Evansville, Indiana
Central Supply Company, Fort Wayne, Indiana
Indianapolis, Indiana
Valley Equipment Company, Mishawaka, Indiana

IOWA
White Refrigeration Supply Co., Davenport, Iowa
Dennis Supply Company, Des Moines, Iowa
Dennis Refrigeration Supply, Sioux City, Iowa

KANSAS
Superior Supply Company, Wichita, Kansas

KENTUCKY
United Service Company, Inc., Lexington, Kentucky
S. W. H. Supply Company, Inc., Louisville, Kentucky

LOUISIANA
Atlas Refrigeration Supplies, Inc., Baton Rouge, Louisiana
Thermal Supply Company, Monroe, Louisiana
Acme Refrigeration, Inc., New Orleans, Louisiana
Interstate Electrix Co. of Shreveport, Inc., Shreveport, Louisiana

MARYLAND
Melchior, Armstrong, Dessau Co., Baltimore, Maryland

MASSACHUSETTS
Melchior, Armstrong, Dessau Co., Boston, Massachusetts

MICHIGAN
Lifsey Distributing Company, Flint, Michigan
Midwest Refrigeration Supply Co., Grand Rapids, Michigan
J. M. Oberc, Inc., Highland Park, Michigan

MINNESOTA
Refrigeration Wholesalers, Inc., Duluth, Minnesota
Refrig. & Industrial Supply Co., Minneapolis, Minnesota
Refrigeration Supply Company, Inc., St. Paul, Minnesota

MISSISSIPPI
Plumbing Wholesale Company, Jackson, Mississippi
Motor Supply Company, Meridian, Mississippi

MISSOURI
Superior Supply Company, Kansas City, Missouri
Hoffman Supply Company, Springfield, Missouri
Authorized Refrigeration Parts Co., St. Louis, Missouri

MONTANA
Refrigeration Supply Company, Billings, Montana
Great Falls, Montana

NEBRASKA
Dennis Refrigeration Supply, Omaha, Nebraska

NEW JERSEY
Melchior, Armstrong, Dessau Co., Newark, New Jersey
Ridgefield, New Jersey

NEW MEXICO
McCombs Refrigeration Supply Co., Albuquerque, New Mexico

NEW YORK
Melchior, Armstrong, Dessau Co., Brooklyn, New York
Buffalo, New York
New York City, New York
Syracuse, New York

NORTH CAROLINA
Hasco, Inc., Durham, North Carolina
Greensboro, North Carolina
Winston-Salem, North Carolina
Noland Company, Inc., Raleigh, North Carolina
Kinston, North Carolina
Wilson, North Carolina

NORTH DAKOTA
Refrigeration Supply Co., Inc., Fargo, North Dakota

OHIO
Williams & Company, Inc., Cincinnati, Ohio
Cleveland, Ohio
Columbus, Ohio
Allied Supply Company, Dayton, Ohio
Lima, Ohio
Williams & Company, Toledo, Ohio

OKLAHOMA
Jones-Newby Supply Co., Inc., Oklahoma City, Oklahoma
K & M Supply Company, Tulsa, Oklahoma

OREGON
Peerless Pacific Company, Portland, Oregon
Eugene, Oregon

PENNSYLVANIA
Melchior, Armstrong, Dessau Co., Philadelphia, Pennsylvania
Williams & Company, Inc., Pittsburgh, Pennsylvania

SOUTH CAROLINA
Roberts Refrigeration Supply Co., Charleston, South Carolina
Noland Company, Inc., Columbia, South Carolina
Spartansburg, South Carolina

TENNESSEE
Refrigeration Equipment Company, Bristol, Tennessee
Noland Company, Inc., Chattanooga, Tennessee
Knoxville Refrigeration Supply, Knoxville, Tennessee
United Refrigeration Supply Co., Memphis, Tennessee
J. B. Thomas Company, Inc., Nashville, Tennessee

TEXAS
United Supply Company, Austin, Texas
Corpus Christi, Texas
Thermal Supply Company, Beaumont, Texas
Climate Supply Co., Dallas, Texas
M & M Refrigeration Supply Co., El Paso, Texas
Texas Refrig. Supply Co., Inc., Fort Worth, Texas
Thermal Supply Company, Galveston, Texas
Houston, Texas
United Supply Company, Harlingen, Texas
San Antonio, Texas
Texas Refrigeration Supply, Waco, Texas

UTAH
Pacific Metals Company, Ltd., Salt Lake City, Utah

VIRGINIA
Noland Company, Inc., Newport News, Virginia
Norfolk, Virginia
Refrigeration Supply Company, Richmond, Virginia
Southern Refrig. Corporation, Roanoke, Virginia

WASHINGTON
Thermal Supply Company, Seattle, Washington

WEST VIRGINIA
Hiner Refrigeration Supply Co., Inc., Charleston, West Virginia

WISCONSIN
Gustave A. Larson Company, Eau Claire, Wisconsin
Green Bay, Wisconsin
Kenosha, Wisconsin
Madison, Wisconsin
Milwaukee, Wisconsin
Oshkosh, Wisconsin
Wausau, Wisconsin
Refrigeration Supply Co., Inc., La Crosse, Wisconsin

Drayer-Hanson Names A. J. Mallinckrodt Special Project Engineer

LOS ANGELES — Appointment of A. J. Mallinckrodt as special projects engineer for Drayer-Hanson, Inc. was announced recently by C. E. Pollock, chief engineer.

The appointment was described as a further step in the 1956 expansion moves of the company. An announcement will be forthcoming on Mallinckrodt's specific activities, Pollock said.

From 1951 to the present, Mallinckrodt was chief engineer at U. S. Air Conditioning Corp., Minneapolis.

From 1944 to 1951 he was manager of engineering, Baker Refrigeration Corp. (formerly Baker Ice Machine Co.), South Windham, Me.

Other affiliations since entering the industry upon receipt of his B.S. in mechanical engineering from the University of Missouri in 1922, include manager of the Refrigeration Dept., Edward H. Teuss, Jr., Inc., Philadelphia—a Baker Ice Machine distributor, and a four-year association with Carrier in both contract engineering and development departments.

In addition, he has been a sales engineer at Westinghouse, assistant chief engineer at Baker Ice Machine, and estimator, application, and sales engineer at Pillsbury Becker Engineering Co., St. Louis.

Mallinckrodt, a professional engineer, is a member of the American Society of Refrigerating Engineers.

Active in the Air-Conditioning & Refrigeration Institute, he is chairman of the Central Station Air Conditioning Committee and Refrigeration Equipment Engineering Committee.

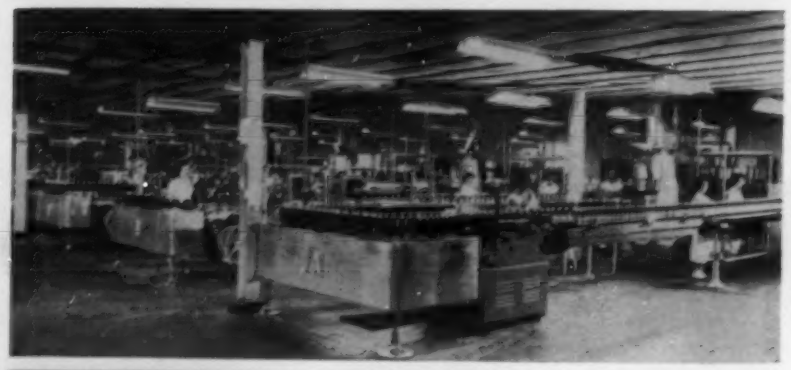
Redmond Opens 3 Area Sales Offices

OWOSSO, Mich. — New area sales offices in the southeast, midwest, and southwest have been opened by the Redmond Co., manufacturer of fractional horsepower electric motors.

According to B. J. Farrell, general sales manager, the new offices, along with major changes in territories, come as the result of continuing market expansion by Redmond.

The new southeast office, located at 1720 Section Rd., Cincinnati, is in charge of Kris Heiberg. The new midwest office is in the Fair Oaks Bldg., Oak Park, Ill., and will be in charge of J. F. Pichiotino.

The southwest office, although still situated in Dallas, has moved to a new location at 4924 Greenville Ave. This office is in charge of R. E. Waffle.



PROPER temperature control of wine and comfort cooling for employes is provided in bottling room at E. & J. Gallo Winery, Modesto, Calif., by Bush model VAH80 vertical air handling unit (left) with 6-row direct expansion coil for cooling and 4-row steam coil for heating. A 25-hp. Brunner condensing unit fills high side requirements.

Vertical Unit Insures Proper Temperature In Winery Bottling Room

MODESTO, Calif. — The modern bottling room at E. & J. Gallo Winery here has been air conditioned to insure proper temperature control of the wine and provide comfort cooling for the 98 employes in the department.

Conditioning is provided by a Bush vertical air handling unit (model VAH80). Because of the variation in ambient temperature (110° in summer to 25° in winter), the unit is equipped with a 6-row direct expansion coil for cooling and a 4-row steam coil for heating.

The unit is also equipped with face and by-pass damper sections, mixing box assembly, and filter section to permit flexibility and closer control.

A 25-hp. Brunner condensing unit fills high side requirements of the system.

Pacific Scientific Names Carline Sales Engineer

LOS ANGELES—Arnold Carline has been appointed a sales engineer in the Air Conditioning Div. of Pacific Scientific Co., according to Decker G. McAllister, president.

A specialist in the gas appliance and heating and air conditioning control fields, Carlin will represent White-Rodgers controls and Alco valves for Pacific, operating from the firm's Los Angeles office.

Previously, he had served as test engineer with the American Gas Association Laboratory, and as chief test engineer for a major manufacturer of air conditioning and control equipment.

Pritchard Appoints Donnelly Wash. Sales Representative

KANSAS CITY, Mo. — The Frank K. Donnelly Co. of Seattle has been appointed sales representative in the state of Washington by J. F. Pritchard & Co. of California here.

Pritchard designs and manufactures cooling towers for air conditioning and industrial applications and "Hydryers," packaged dehydration units for air and other gases.

For more information about products advertised on this page use Information Center, page 66.

Texas Drug Store Meets Odor Problem With Exhaust Fan, Added Cooling and Luncheonette Volume Grows

WACO, Texas—A novel application of comfort air conditioning has completely eliminated the problem of objectionable odors in the new fountain-restaurant of the Ottis Stahl Pharmacy, Waco.

Ottis Stahl, owner of the outstanding drugstore, which features deluxe toiletries departments, gift shops, along with a 50-person capacity restaurant, allocated some $10,000 to remodeling of food service facilities. Anxious to develop a fountain-luncheonette which could compete with any restaurant in the city, he listed off all of the "drawbacks" which normally occur in drugstore food service, and spared no expense in overcoming them.

One of the worst, he indicated, has been the emission of unpleasant cooking odors throughout the rest of the store, as well as the fountain itself.

Accordingly, a partitioning wall was installed across the back of the store providing space of an 18 by 12-ft. kitchen. Completely equipped with stainless steel, the kitchen is entirely visible through a 6 by 6-ft. plate glass window in the center.

Pulls Air From Store

To prevent the circulation of odors, the Texas druggist then installed a 3,500 c.f.m. exhaust fan in the ceiling of the kitchen. Cooled air from the drugstore proper is pulled through at high velocity through a narrow service window slit in the bottom of the plate glass "kitchen display window."

The 20-ton store air conditioning system was increased by 5 tons output capacity to compensate for the constant drawing off of the kitchen fan.

Now, no matter what food preparation is going on in the kitchen, all odors stop short at the service window. Even when a full-size door to the right of the window is opened, there is still no noticeable penetration of such odors.

Likewise of high interest is the $4,000 stainless steel backbar fixture which the Texas druggist installed behind the fountain. Designed to do away altogether with the problem of equipment, foods, bootles, etc., set here and there around the fountain, it contains 11 compartments down its 24-ft. length.

In the center section are three cooled compartments which operate at 32° F., and an 11-cu. ft. freezer compartment, operating at -10° F.

Novel Food Storage

A 1½-ton compressor, with separate thermostats, and bypass valves, provides refrigeration for both. Because of the high capacity for frozen foods which the second compartment permits, the store is able to keep on hand large quanties of frozen seafoods, chicken, etc., to guard against embarrassing "run-outs" or heavy food service traffic.

With eight plastic upholstered booths, nine tables, and 14 stools at the fountain, the store averages over 200 luncheon customers per day.

Embry Handles 'Recold' In Alabama, Georgia

LOS ANGELES—B. W. Embry Co., Atlanta, has been appointed exclusive distributor for "Recold" air conditioning and refrigeration products in Alabama and Georgia.

Announcement was made by Hy Jarvis, president of Refrigeration Engineering, Inc., Los Angeles, which markets its products under the Recold trade name.

B. W. Embry operates the Embry Co. Embry was formerly a district manager for Baker Refrigeration Corp. in the Atlanta area. More recently he was with the Hardy Corp. in Birmingham, Ala.

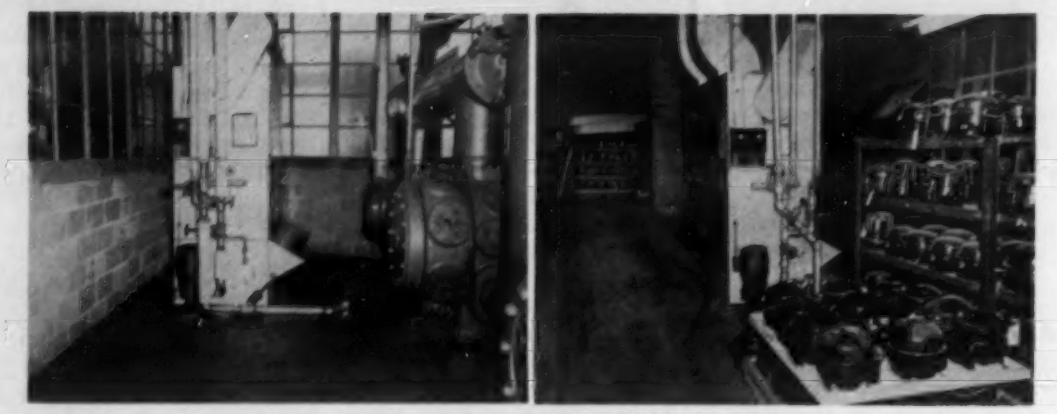
Embry has a diversified background in the industry. He started as a heating and air conditioning engineer for the U. S. Government.

For more information about products advertised on this page use Information Center, page 66.

How Water Savers Solved Water Shortage Problem In Tecumseh, Mich.

TECUMSEH, Mich. — What does an industrial firm do when it outgrows the water supply system in the community where it is located?

Tecumseh Products Co., one of the country's largest manufacturers of condensing units for refrigeration and air conditioning, and the largest single consumer of water in the city of Tecumseh, faced this situation early last year.



Two of the nine Acme cooling towers installed in the Tecumseh Products Co. plant are shown above. Installation of these towers allowed for reuse of water so that water consumption was reduced by nearly 22 million gals. per month. Water consumption of the large plant, located in a small town had led to a serious water shortage,that threatened fire protection.

Following the phenomenal growth of the company in recent years, it became apparent that diverting more water from the city supply would make it impossible to supply homes in the community with water, and place the fire protection system in jeopardy.

As Tecumseh Products has grown, the city itself has grown, and both the plant and city needed more and more water. Commenting on the situation, the *Tecumseh News* reported:

"The middle of last summer it became apparent that we did not have enough water in the city of Tecumseh to carry on the industrial procedures in our plant, and supply the homes with water.

"Our engineers decided that the continuation of full operation depended on either obtaining a more adequate supply of water, or instigating a substantial conservation program of the water being used in our industrial purposes.

"An inspection of the underground water strata disclosed that the water was not available to us from the ground, so various methods of water conservation were surveyed."

Checking plant operations showed that 22 million gallons of water per month flowed directly to the sewer after one use. This water was used only for cooling and was unaffected chemically during the plant operations. The only problem then was to determine a method to cool the water sufficiently after each cycle to permit its re-use.

About that time the problem was placed in the hands of A. G. Wirick, Tecumseh plant engineer. Preliminary engineering surveys indicated that the job could be handled by one or two large cooling towers on the roof of the plant.

One-Third of Water Used In 10 Locations

At the same time it was noted that approximately one-third of the water used in the plant is consolidated in 10 specific locations, and these could each be served by an individual tower.

A cost comparison between the two methods was made, and it was found that the use of individual towers, close to the machines they served, would be the most economical arrangement.

The original plan to install a series of re-circulating towers involved a total expenditure of approximately $20,000 including $10,000 for seven towers, $2,000 labor in the plant, and $6,500 for ductwork and materials. This was approved by management.

Commenting on the nine tow-

(Concluded on next page)

For more information about products advertised on this page use Information Center, page 66.

Water Consumption, Costs, Amortization Time for 7 Towers

Equipment Served	Water Used Monthly (Gal.)	Water Cost Monthly	Installed Cost Acme Cooling Towers	Amortization Time in Months
Two 50-hp. Ice Machines	4,320,000	$194	$3,083	16
Two Air Compressors ..	2,602,000	118	2,045	17
One 50-hp. Air Conditioner	2,160,000	97	2,206	22
One 20-hp. Air Conditioner	1,080,000	50	1,295	25
325-hp. Air Compressor .	2,652,000	120	2,045	17
725-hp. Air Compressor .	6,480,000	195	2,662	13
400-hp. Air Compressor .	2,700,000	122	2,045	17

Cooling Towers--

(Concluded from preceding page)

ers that have now been installed at various points in the plant, *Tecumseh News* says:

"Our engineers feel that the decision to re-circulate water was based on sound principles. We have been able to operate all through the summer months even though the city pressure has at times dropped down below operation levels.

These nine towers are represented by the following number and sizes: one 70 ton, one 35 ton, three 45 ton, three 30 ton, one 20 ton.

Economy Cited

In addition to the fact that the city of Tecumseh has enough water, and the plant has enough water, is the important matter of dollar savings.

The accompanying table shows a breakdown of water consumption, costs, and amortization time of seven of the Acme Industries, Inc. cooling towers. The monthly water cost for each unit is computed on the basis of 3 cents per gallon, plus a 50% sewer charge, or a total of 4½ cents.

"A quick glance at the chart shows that the individual towers will pay for themselves in from 13 to 25 months, and at the end of that time will accrue important savings for the company," Acme Industries said.

Greater the Water Use Faster the Amortization

"A closer glance at the chart shows that the larger the water use in an individual location, the greater the saving. For example, the smallest unit—a 20-hp. air conditioner, is served by a tower that will pay for itself in 25 months, while the largest unit, a 725-hp. air compressor is served by a tower that will pay for itself in only 13 months. The over-all average, however, of amortization in 20 months is all that could be expected from equipment of this type."

The water savings for Tecumseh Products by the use of Acme cooling towers have been verified by *Tecumseh News* which reports: "The water conservation figures have been borne out by our monthly (water) billings, which show a drop from 62 million gallons per month to 40 million gallons per month." This is a cool savings of 22 million gals.

In planning the installation, Wirick was assisted by his own staff, and by Bill Hart, Acme field sales engineer for southeastern Michigan.

New Ideas on Comfort Air Conditioning Standards Are Revealed In Studies Made by University of Illinois

ATLANTIC CITY, N. J.—The "new fields" conference at the annual meeting of the ASRE heard Prof. M. K. Fahnestock of the University of Illinois with some new slants on environmental factors affecting human comfort.

Sedentary or slightly active healthy men and women normally clothed, Prof. Fahnestock declared, are comfortable year around at temperatures of 73° to 77° F. with relative humidity between 25% and 60% and an air movement of about 25 f.p.m.

"The individual is a heat-producing machine, but people are different and they're dressed differently," he commented.

The four environmental factors affecting thermal comfort of human beings, he explained, are temperature, humidity, air movement, and radiation.

"The degree of activity is an important factor in the heat given off by an individual."

'EFFECTIVE TEMPERATURE' MAY NOT BE CORRECT

He also commented that "we have good reason to believe that 'effective temperature' as we use it today is not correct. It is wrong to believe that you can increase humidity while lowering the dry bulb temperature and still maintain comfort," contends Prof. Fahnestock.

At the temperature range of 73° to 77°, relative humidity should not exceed 60% for summer comfort, but in winter it can range from 25% to 60%.

It was emphasized by Prof. Fahnestock that these figures are based on making 90% of the people in a given air conditioned space comfortable. Differences in individuals may result in 10% or less not being comfortable under the above conditions.

A question was raised as to the possible effects on comfort of radiation from an individual seated beside a cold window in an office and whether there was any "empirical figure" for adjusting the dry bulb temperature in relation to mean radiant temperature.

"In winter the kind of clothing and degree of activity are more important factors than the radiant temperature, Prof. Fahnestock commented, but he added that 'we don't really have any data on effective radiation."

Pickus Outlines 8-Step Selection Plan To Help Retailers Hire Best Salesmen

CHICAGO—Millions of dollars have been wasted in the retail appliance field training salesmen who should never have been hired.

So declared Morris I. Pickus, president of The Personnel Institute, Inc., in addressing the annual convention of the National Appliance & Radio-TV Dealers Association on "How To Find and Hire Profit Producing Salesmen." He made the statement in describing an eight-step, scientific selection program.

Pickus said he has asked dealers what they consider the most important asset in their business. All the answers have been wrong, he asserted.

For example, one retailer said his location was the most important thing; another, the franchised exclusive merchandise he carries; another, his store's reputation; another, his firm's advertising program, Pickus pointed out.

Retailer's Most Important Asset Are 'His People'

But not one said that the most important asset in his store is "my people," the speaker stated, adding: "There is nothing more important than your people."

Pickus noted that big companies spend thousands of dollars on schooling for their employes. So why shouldn't retailers spend "a few bucks" on their new salesmen? he asked. Generally speaking, retailers haven't realized the great potential in people, he said in calling attention to the need for better selection, training, and supervision of all employes in an organization.

Businessmen are finding out that the cost of recruiting, hiring, and training the salesman, only to have him fail and leave the company's employment, is becoming an increasingly severe financial burden, Pickus indicated.

System Outlined

Outlining the eight-step selection system, Pickus explained that the first step is to write down a complete **job description.** He said this "blueprint" should include everything the employe should know and do to handle the job properly.

When interviewing an applicant, look at him in terms of the job description, Pickus advised. He said it will also help the dealer train and supervise the employe.

(Pickus asked how many in the meeting room had written job descriptions. He announced the count of raised hands as "seven out of 300.")

Step two is **man specifications** —"written descriptions of the qualities you seek in the employe who is to fit the job. They describe the man you are looking for." Man specifications include age, education, physical factors, experience, personality, etc.

Step three is **comprehensive recruiting.** This means using every practical source to obtain applicants. And look at 20 or even 50 applicants before you hire one, Pickus stressed.

These first three steps are the foundation of a scientific selection system, he said. The next five are "yardsticks."

First of these is the **preliminary screening interview** which "serves to weed out applicants who are obviously unsuited."

Pickus said the preliminary interview form can be a simple, one-page form, such as the one The Personnel Institute has developed. This particular type of form helps the interviewer find out within 10 minutes whether the applicant can meet the minimum man specifications, he noted.

Applicants who pass the screening interview should be given a **personal history inventory** to fill out, the dealers were told. This form is much more comprehensive than the usual application blank, he pointed out, adding that the Personnel Institute's form is six pages long.

How Can You Hire a Man Without Application Blank

(Pickus wanted to know how many of those present had application blanks. Estimating that "less than 5%" raised their hands, he asked: "How can you hire a man without an application blank?")

No one should be hired solely on the basis of a preliminary interview or personal history inventory, Pickus continued. If the applicant looks like a "possibility," he should be called back for a second or **diagnostic interview.**

A four-page form containing questions to ask the applicant

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Selection Plan--

(Concluded from preceding page)

"and yourself" can be used to help get the facts which have bearing on the success or failure of the applicant, he explained. This form is designed to help the interviewer "dig" into the applicant's attitudes, habits, motivation, and capacity for working cooperatively.

Step seven and the fourth yardstock is the **work reference investigation.** This is used to obtain information from former employers on past performance of the applicant. Among other things, former employers should be asked why the applicant left their employe and "would you rehire him?" Pickus said.

Final step is the **aptitude test**—"an objective check on how good an interviewer you are, and whether you have done an effective job in analyzing the personal history inventory, and in investigating the applicant's work references."

Steps four, five, six, and seven are given a combined weighting of 60% in the hiring process and step eight a weighting of 40%, according to Pickus. Aptitude tests are useful only when used in conjunction with the other basic selection steps, in his opinion.

Answering questions, Pickus said The Personnel Institute has a special "Selector" test battery designed for retail salesmen and a special supervisory test battery for selection and upgrading of store managers, department managers, and section heads.

BBB Checks Retailers On Comparative Price Advertising Abuses

PITTSBURGH—A long-range program designed to correct abuses in comparative price advertising in the retail field has been launched by a three-man committee of the Association of Better Business Bureaus.

The Comparative Price Committee has developed, and sent to BBB offices throughout the country, "packages" containing procedure lists, check lists, and other material to be distributed to retailers recently, it was reported.

Results of the program in seven key cities will be analyzed. The cities are Pittsburgh, New Orleans, St. Louis, Chicago, Boston, Cleveland, and Akron.

Retailers were to be given check lists for store advertising departments and buyers.

The lists ask these questions:

1. Permanent markdowns: Is the comparative price the last regular previous price in your store? Has the price been maintained without temporary markups?
2. Discontinued models: If the article has been discontinued, have you made this prominently clear in the advertisement?
3. Temporary markdown: Is the comparative price the price regularly in effect in your store immediately before this offering? Is the comparative price the price to which this article will revert following this offering?
4. Markdowns from list: Does the article regularly sell in your store at the list price? Will it revert to list price following the offering?
5. Special purchases: Is the advertised article equivalent in quality, grade, substance, workmanship, performance? Is the article or its equivalent currently sold in your store or market at the quoted comparative price?
6. Seconds or irregulars: If the article is second, irregular, imperfect, or damaged, have you stated such fact prominently?
7. Other markdowns: If your proposed markdown is not covered by this check list, does it comply with the provisions of the BBB guide for retail advertising and selling?

G. H. Dennison, general manager of the Pittsburgh BBB and head of the committee, said bureaus will be asked to sponsor meetings of all media to discuss the problem of comparative price abuses.

Dallas Awards Contract for Its First Fully Air Conditioned Fire Station

DALLAS—This city's newest fire station will be its first completely air conditioned one, it was reported here recently.

Contract for construction awarded by City Council for $60,350 includes full air conditioning, it was learned.

In discussing the contract, Councilmen were agreed that this was a "good" step forward. "Those boys work pretty hard," one is quoted.

"They need to cool off after what they go through in a day."

At present, most of the city's fire stations are air conditioned only by room units, it was added.

'Short, Short' Course In Air Conditioning Fundamentals-1

Frigidaire's D. C. Schaffer Condenses Basic Knowledge Into Brief Summary for Salesmen, Servicemen, and Dealers

Sometimes we in air conditioning use technical terms so glibly and often that we assume we know what we are talking about—and everyone else does, too. But if someone should ask you what is air? What is dry bulb? What is dewpoint? What is the comfort zone? Could you answer correctly?

D. C. Schaffer, training supervisor for the service department in the Frigidaire Div., General Motors Corp., assumes nothing. He explains everything in his "short course" on air conditioning, beginning here and continuing in succeeding issues of the NEWS.

If you aren't sure of your answers, start reading now!

ATLANTIC CITY, N. J.—A "short, short" course on the fundamentals of air conditioning tailored to the needs of the serviceman was offered by D. C. Schaffer, training supervisor in the service department of Frigidaire Div. of General Motors Corp. at the recent Refrigeration Service Engineers Society convention here.

His hour-long course was intended to give the servicemen a broader understanding of the more important phases of air conditioning and a better appreciation of the problems they will encounter in the field. It also endeavored to give them some idea of the problems encountered by design engineers and those who sell this equipment.

Terms Explained

He explained the meaning of many terms used in air conditioning, outlined the basic factors involved, and described the use of some service instruments.

Starting with the air itself, Schaffer noted that air is not a simple thing but is made up of quite a few elements and compounds. An average sample of air, he said, could be found to contain 78.5% nitrogen, 21% oxygen, and 0.5% of carbon dioxide and other gases.

While the oxygen in the air sustains life, the nitrogen dilutes the active oxygen to prevent oxidization of body tissues.

Even though air cannot be seen, he said, we know that it has weight because all of the elements of which it is composed have definite atomic weight. A square inch column of air extending from sea level to infinity weighs 14.7 lbs.

Air Is a Conveyor

But most important to air conditioning, air is a conveyor. It conveys heat, water, smoke and fumes, dirt and dust, odors and pollen, and sound.

"Since all of these factors have an effect on human health and comfort and some of these have an effect on industrial processing, we can define true air conditioning as the controlling of five fundamental factors," Schaffer said.

"These factors are heat, moisture, filtration, circulation, and ventilation."

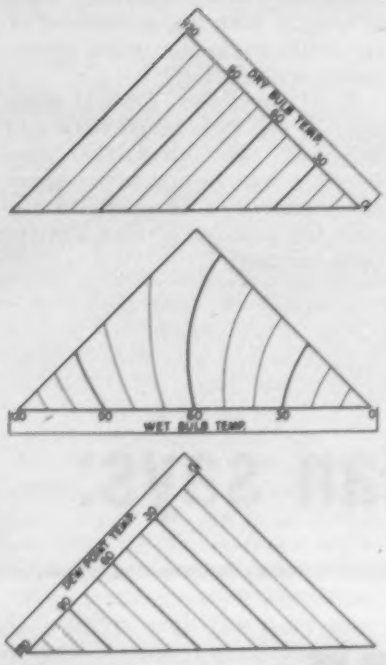
First and one of the more important is heat. Obviously, he continued, the amount of heat carried by the air has a definite effect upon the comfort and health of human beings as well as it does upon the growth of mold and bacteria in the things we eat.

In comfort air conditioning, a constant temperature at a comfortable degree is highly essential if complete user satisfaction is to be attained.

However, he noted, complete comfort cannot be maintained by temperature alone. The amount of moisture in the air has a large part to play in the health and comfort of human beings.

'Grain' Is Measure Of Moisture

"The unit of measure of moisture in the air is called a grain," Schaffer explained. "This term is an early English measure of weight derived from the weight of a grain of wheat. A pound of water weighs 7,000 grains.



THREE BASIC ELEMENTS of a Psychrometric Chart are shown above. What they mean and how they are used are explained in column 5. A complete Psychrometric chart is not shown here because of the difficulties of reducing one to a few columns without making it a meaningless blur. Charts are readily available from numerous sources for those who do not have one.

"Since the moisture in the air is in a gaseous form and at a temperature below the boiling point, we call it water vapor. . . . Any vapor changes in pressure as the temperature increases and decreases. The higher the temperature, the higher the pressure.

"Due to the fact that air is made up of other vapors as well as water vapor, there is naturally a pressure-temperature relationship involved. Likewise, there is a change in volume of air as the temperature changes.

"Just as nature does not provide an even temperature in any locality and the temperature in different localities is generally higher or lower than in others, so does she provide variable quantities of water vapor.

"Saturated air is air that contains all the moisture it can hold without precipitation. The amount of moisture that air can hold depends upon its temperature.

"For example, a cubic foot of air at 0° can hold only .47 grains, while at 70° it can hold 8.1 grains.

Air Can Be Saturated At Any Temperature

"From this we can see that air can be saturated at any temperature. It just takes a smaller quantity of moisture to produce saturation as the temperature decreases.

"There is a term commonly used in air conditioning, 'dewpoint,' which is closely related to saturated air. Dewpoint may be defined as the lowest temperature to which air can be cooled without the condensation or 'raining out' of some of the water vapor or moisture.

"For example, if we have a quantity of saturated air at 70° F., any lowering of temperature, even a fraction of a degree, will cause some of the water vapor to condense. The dewpoint temperature is then 70°.

"The dewpoint temperature of air can be determined without actually having it saturated.

"Relative humidity may be defined as the ratio between the amount of moisture in the air and the amount that it could hold at the same temperature. It's the actual grains per pound divided by the grains per pound if saturated at the given temperature.

"For example, if we have air at 70° F. that we know contains 55.1 grains per pound and we know that it could hold 110.2 grains if fully saturated at 70° F., the relative humidity would be 55.1 divided by 110.2 x 100, which gives us 50%.

"In air conditioning work, whether it be cooling or heating, most reference to the quantity of moisture in the air is made in percentage or relative humidity.

Study of Air, Moisture Is Called Psychrometry

"The study of air and moisture is called Psychrometry. A device employed in determining the various properties of air is a Sling Psychrometer.

"This device is a plate having a swivel handle. To this plate is attached two Fahrenheit thermometers, one of which has a cloth sack around the bulb.

"The purpose of the Sling Psychrometer is to obtain the temperature difference between the dry bulb or sensible temperature and the wet-bulb temperature which involves evaporative cooling.

"When the sack is wet and the psychrometer whirled, evaporative cooling causes a reduction in temperature greater than that on the dry-bulb thermometer.

"The amount the wet-bulb temperature reduces depends upon the amount of moisture in the air—the less moisture, the greater the reduction. After the temperature difference between the wet and dry bulb has been noted, the relative humidity can be determined from published tables or by means of a Psychrometric Chart.

Chart Is Made Up Of Three Triangles

"To one not familiar with it—a psychrometric chart is a confusing mass of lines. Actually, it is three triangles, each superimposed over the other.

"The first triangle represents the dry-bulb temperature through a range of degrees from 0° to 120°. The lines are parallel and run perpendicular to the dry-bulb column. The dry-bulb temperature is the same

(Continued on next page)

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Short, Short Course--

(Continued from preceding page)

on the entire length of line. On a complete chart each degree is represented by a line.

"The second triangle represents the wet-bulb temperature. It too covers a temperature range from 0° to 120°. Like the dry-bulb chart, the temperature is the same on the entire length of line. However, please note that the lines are neither parallel nor do they extend perpendicular from the column, but fan out in curved lines.

"The last triangle represents the dewpoint temperature. Like the other two, it covers a range from 0° to 120°, and the temperature is the same for the entire length of line.

"Added to these are the relative humidity lines, running horizontally from the dewpoint column to the dry-bulb column.

How To Use Psychrometric Chart

"For those of you who may not be familiar with psychrometric charts, let us see how one can be used at an advantage.

"First, we'll use this sling sychrometer and find out what the dry and wet-bulb temperature is.

"The dry-bulb temperature is 74° and the wet bulb shows 61°, for example. We now have two known factors. Starting with the dry-bulb column, we follow the 74° line until it intersects with the 61° wet-bulb line.

"We find the two intersect at a point just above the 45% relative humidity line. By interpolation we know the RH is 46%.

"We also find that this intersection point is on the line extending to the dewpoint temperature column. The dewpoint temperature is 52°.

"As long as any two of the four factors are known, we can use a psychrometric chart and find the others.

Slide Rule Helps Find Relative Humidity

"To find the relative humidity only, a very simple tool has been developed. This tool is called a psychrometric slide rule."

Schaffer noted that "primarily, we are concerned with the movement of air within the conditioned area or space. User dissatisfaction is often the result of improper air movement even though the temperature and relative humidity are being maintained at the proper level.

"Velocity below 15 f.p.m. may result in the stratification of the warm and cool air in the room and produce the sense of 'stuffiness.' In other words, the air movement must be sufficient to carry away the heat and moisture given off by the human body. Otherwise the body becomes enveloped with a stagnant cloud of warm, moist air.

Higher Air Velocities Suitable for Summer

"During the heating season, air velocities in excess of 25 or 30 f.p.m. usually give undesirable results. With summer cooling, velocities up to 40 or 50 f.p.m. seems to give satisfactory results.

"Warm air rises and cool air falls. We know that a natural circulation can be produced when we have areas of different temperature.

"However, in all air conditioning systems, whether it is summer cooling or winter heating, we rely on fans to produce the desired air movement and in some cases provide ducts for the moving air to travel in from the equipment to the conditioned area.

Axial Flow and Radial Flow Fans

"Fans can be segregated into two general classifications. These are the axial flow or propeller type and the radial flow or centrifugal type, better known perhaps as the squirrel cage.

"The axial type is so called because the air stream is parallel to the axis. The radial type gets its name also from the air flow which is parallel to the radius of rotation.

"Each type has advantages and disadvantages which limit their application. Such factors as resistance, noise, efficiency, and the horsepower of the source of propulsion must be considered when selecting the type to use.

"The propeller-type fan will deliver larger volumes of air with less horsepower required than the centrifugal type as long as there is no static pressure to work against.

"This is the main reason that propeller fans are always used when the displacement of air is the prime requisite and where no piping or ductwork is required. The usual application is for ventilating purposes where the fan is located on an outside wall and the air drawn directly from the room and discharged to the outside.

"Due to the fact that this type of fan is inherently noisy when moving large volumes of air at high speed, it is not recommended for most applications of comfort air conditioning, but in industrial processing, where noise is not objectionable, the high mechanical efficiency makes it most desirable.

"The centrifugal fan has two distinct advantages over the propeller type which are quite important in comfort air conditioning. One is the quietness of operation and the other is the ability to perform satisfactorily against resistance pressure encountered in the ducts which most air conditioning systems use.

"The centrifugal-type fan is available in three blade arrangements; the radial tip or paddle wheel, backward curved, and forward curved blade.

"The radial tip blade is seldom used in comfort air conditioning. Ordinarily, the efficiency of the straight blade is lower than either of the curved blade fans. However, it lends itself to industrial applications, where large capacity and high-pressure air is required.

"The backward curved blade unit is usually used with direct-connected motors of high speed while the forward curved blade unit adapts itself for belt drive at a considerably lower speed.

"In either case, the resistance pressure against which the fans operate largely determines the tip speed and the outlet velocity.

"For example, with the same resistance pressure, a backward curved blade, the outlet velocity is 900 to 1,300 with a tip speed of 3,400 to 4,000 f.p.m. while with the forward curved blade, the velocity is 1,000 to 1,200 with a tip speed of only 1,970 to 2,150 f.p.m.

"The forward curved fan is used more often for most air conditioning and ventilating work. Its slower speed tends to provide for quieter operation and it is compact.

(To Be Continued)

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Selling Residential Systems

Louisville Dealer's Complete Records on Customers, Continuing Promotion Efforts, Pay Off In New Sales

By John O. Sweet & George M. Hanning

LOUISVILLE, Ky. — Selling residential air conditioning to owners of existing homes is a three-year job, generally speaking, figures Harold L. Carr, vice president of Hart Furnace & Supply Co. here.

First Year Gets Shock At Conditioner Prices

The first year, the homeowner becomes interested in air conditioning through advertising and promotional material. He asks for information on prices, and is usually shocked at the cost. It's maybe 50 to 60% more than he thought. So he puts off the purchase.

Third Year Gets Mad, Buys Conditioner

The second year, the homeowner will check again on prices, hoping they have gone down. When told, most probably, that prices have gone up instead, he decides he can wait a while longer.

The following summer, when he begins to suffer from the heat, he finally gets mad and decides he's got to have air conditioning—now. And when he does, he generally pays cash for it. Carr said he has had only one such job on credit so far.

This has been the general pattern in the six years the old-line heating firm has been in the air conditioning business, according to Carr.

Originally, Hart manufactured, distributed, and installed coal furnaces. In trend with the times, it dropped its manufacturing operations in 1946 and formed a new company to handle automatic heating equipment. The new organization is headed by Harold B. Villesvik.

The company presently consists of two divisions, with separate staff. One is a distributing organization which serves 57 small-town dealers within a radius of about 100 miles. Handling the Mueller Climatrol lines, it offers dealers a complete engineering service on both heating and air conditioning.

"We do the engineering, they come in and buy a package," Carr explained. "The days of laying out a job by rule of thumb are gone. We furnish complete, detailed layouts because the business is so much more complicated today, what with electronic controls, multiple zones, and such."

The other division does contracting work. Its activities are confined to Jefferson County, except in occasional cases when a dealer needs assistance. In addition to residential air conditioning, the division takes on small commercial jobs—running up to 15 tons.

Firm Can't Keep Up With Work Load

Despite the fact that the company's personnel has been doubled in the last four years, they are having a tough time keeping up with all their work, Carr observed.

This is partly due to more complicated paper work but also to increasing volume of business, he said, adding: "We're doing more business this year than we ever dreamed of."

Carr, a University of Kentucky graduate who joined the firm in 1947, heads the air conditioning department. He pointed out that the company started out slowly in this field but has been picking up speed each year.

Air Conditioning Dollar Volume Jumps 4% In Year

In 1954, air conditioning accounted for 11% of the firm's dollar volume. This year it's 15%. In unit volume, air conditioning amounts to 10% of total sales.

At first, the concern sub-contracted its refrigeration work to a one-man service firm. However, it found it was getting "priced out" because of "too many pluses on costs."

So two years ago, Hart Furnace set up its own installation and service department. It bought out McKinley and brought him into its organization.

Dillard Eigel, who is experienced in heating service, helps McKinley on refrigeration service and is learning the art from him. In the fall and winter, Eigel returns the favor, teaching McKinley heating service. With business continuing to grow, Carr said that next year the company will need three full-time service and installation men.

Now Handles Everything Except Electrical Work

The company can now handle everything except electrical work, which is subcontracted. Carr commented that it's difficult to find good electricians who understand air conditioning.

To increase their understanding of the art, the firm repeatedly sends management, sales, and service personnel to association and factory schools for training.

In seeking air conditioning business, Hart draws heavily on its long experience in the heating field. It maintains a complete file on all furnace installations made since 1945. This file is kept up to date constantly, with every purchase and every service call recorded.

The majority of the names in the file are those of satisfied customers, Carr pointed out.

Biggest Selling Point

"This is our biggest selling point," he stressed. "They bought their heating equipment from us and they would prefer to get their air conditioning from us."

Measuring 4 in. by 6 in., the cards are color-coded—white for gas installations and yellow for oil—(blue cards for air conditioning also are kept on file). All cards are filed according to address. A space at the top of the card is allowed for this information, and also the purchaser's name, date of purchase, and present owner.

The card for gas installations has spaces for data on furnace, filters, thermostat,

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Furnace Card File Pays Dividends--

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transformer, gas valve, fan and limit, pilot, pilotstat, motor, belt, and humidifier. On the card for oil installations are spaces for similar information.

The air conditioning card has spaces for information on the cooling unit and serial number, compressor and serial number, blower motor, belt, thermostat, relays, tower, and pump.

Service call data is recorded on the backs of all cards where there are spaces for date, invoice number, work done, and amount charged.

When business slows down after the first of the year, the names of old customers are dug out of the file. These people are contacted by phone and, if interested, appointments are made for salesmen to call at the customer's convenience.

The salesman then checks the customer's folder. Individual folders are filed by year and name and contain complete information pertaining to furnace installations. This includes a sketch and dimensions of the house, drawing of the heating distribution system, and figures on heating load calculations. The folder may even contain a previously-made air conditioning survey.

This file gives the salesman selling air conditioning to a former furnace customer detailed data on the customer's home so he has a complete picture when he calls.

"It is very impressive to the customer to show him all the information, including calculations and layouts, on the heating job," Carr pointed out. "This is a good sales aid since it starts us out on the right foot."

From its card file, the company last spring selected 1,000 names of persons for whom it had installed Mueller furnaces. To these, Hart sent a series of four mailing pieces, prepared by Mueller, each carrying a humorous message and inviting the prospect to ask for further information on an attached reply card.

The mailers were to be sent out every two weeks. The first two went out on schedule in May, but due to cool weather, mailing of the other two were delayed until warmer weather arrived.

Carr said the return was about the same on all four pieces. He figured the return ran around 7%, which he considered quite good.

"I didn't believe in this kind of advertising before," Carr commented, "but after trying it, we are very satisfied with the results."

Leads resulting from the direct mail campaign were given to the salesman who closed the heating sale because he was previously acquainted with the customer.

This was no problem since all of the salesmen have been with the company for even more years than Carr. One joined the firm in 1925, one in 1932, and the other in 1937.

This is one of the advantages of being in business for a long time, Carr noted. But, he added, it can also be a drawback "because we find ourselves getting complacent from time to time and we have to fight to keep on the ball."

The company also uses newspaper advertising. It believes in constant repetition to keep its name before the public, Carr pointed out. It runs small ads four times a week (Monday through Thursday) all year long, plus an occasional spot ad when the time seems ripe.

Carr confessed he doesn't know exactly how productive the newspaper advertising is. It can't be measured in terms of individual sales, he said, but he believes it has a beneficial overall effect. "It reminds people we're still in business."

In general, salesmen make heating and cooling load calculations themselves, using a standard Mueller estimating form. Their calculations are checked against the ASHAE estimating form to make sure there are no errors. They also use Mueller's prepared presentation folder and a simple contract proposal.

Salesmen do their own pricing, which is usually double-checked in the office. After a sale is closed, the engineering department, headed by Lyle Pendleton, takes over on layouts.

Installations are supervised by the salesmen, who are trained to do so. Usually, Carr checks all jobs in the field to see that they are progressing properly.

The company maintains its own sheet metal shop for fabrication work.

He pointed out that Louisville has no water problem, such as plagues other areas. But it does have a serious electric distribution problem. Over one hot weekend, more than 50% of the units went out due to power failure, he stated.

ADDRESS -

PURCHASED BY - DATE -

OWNER -

FURNACE -	FILTERS -
THERMOSTAT -	TRANSFORMER -
OIL BURNER -	FAN & LIMIT -
NOZZLE -	RELAY -
BLOWER MOTOR -	BELT -
BLOWER MOTOR -	HUMIDIFIER -
PUMP -	

A FILE FULL OF CARDS such as this listing satisfied furnace customers provides excellent leads for residential air conditioning sales.

Hart generally puts in 100-amp service, according to Carr. Almost always, it is necessary to rewire existing homes, which costs about $130, he said.

Carr commented that he believes in telling the customer that air conditioning is going to cost him money to operate.

"In Louisville, it'll cost him as much for air conditioning in a year as it does to heat by oil, and more than to heat by gas," Carr stated. "However, because the cooling season is shorter than the heating season, air conditioning is more costly per month."

How Residential Cooling-Heating System Controls Function (2)

Of the many components that make up a residential air conditioning installation none is more important than the controls. While a good control system cannot overcome mistakes in sizing of equipment or improper duct design, the best installation will not give satisfaction without proper controls.

The following is the second section of an article by Douglas S. Sterner of General Controls discussing controls. In it he describes the various types of methods now in use. Final instalment will also be devoted to controls.

By Douglas S. Sterner, Manager, Air Conditioning-Refrigeration Controls Div., General Controls Co.

Provision also should be made at the thermostat to take care of such system variations as may be desired. For example, a blower switch which gives selectivity of blower operation during cooling. This is accomplished by the use of a fan switch which has an "auto" position and an "on" position. In the automatic position the blower cycles with the compressor; while in the "on" position the blower operates continuously during the cooling cycle whether the compressor is operating or not.

Cycling Blower, Compressor Tends To Keep Better Humidity Conditions

It is interesting to note that cycling the blower with the compressor tends to keep better humidity conditions in the home because the moisture on the coil is not re-evaporated and delivered into the conditioned space during the compressor "off" periods.

However, intermittent blower operation tends to create a feeling of stuffiness which is corrected by continuous blower operation, and this is the more desirable practice, according to the experts.

It also is possible for the blower to be operated with the switch in the "on" position, even though the system is in an "off" position, without heating or cooling, to provide for ventilation or air circulation only.

Other Variations

Other variations that may be incorporated into the thermostat are:

(a) The system switch, commonly used to turn the system "on" or "off." With a manual changeover thermostat, this switch is usually combined with the changeover switch.

(b) A damper control, occasionally required in order to put a changeover damper in the correct position by means of a damper motor for either heating or cooling. This generally is incorporated into the changeover switch.

(c) The remote reset switch, one of the latest developments and one which has been received with considerable interest by most manufacturers. It becomes a part of the thermostat changeover switch or system switch.

This circuit, by means of other controls, permits the system to be started up after a shutdown due to the high or low-pressure switch cutting out or the overload protection devices cutting out; providing that the cause of the cut-out is no longer present and the protective devices have remade their contact.

The high and low-pressure switches and the overload protective devices in this system are of the automatic reset type, but this circuit will provide for the same safety as with manual reset devices, reset being accomplished at the thermostat.

The convenience of being able to quickly and simply reset the protective devices at the thermostat without going to the remotely located condensing unit is an attractive feature of this.

Additional attributes of the General Controls circuit are that on occasions when the power supply may be interrupted, the conditioning unit returns to the operating cycle immediately upon resumption of power without the need for manual resetting of the system, and then on failure of the reset circuit the system "fails" in the safe or off position.

Cooling-only thermostats are available and have been used frequently in the past, though the trend definitely is toward the combination thermostat, even in installations where the actual cooling unit may be added some time after the heating system is installed.

A room thermostat has other basic requirements in addition to being a sensitive and reliable control instrument, a master switching panel. It must also be beautiful in appearance, modern in design, and of such color and shape that it will blend with any color scheme found in the home.

How Thermostat Controls Temperature

How does the thermostat control temperatures in the home?

In all the common cooling systems, whether they be integral, additive, or split, the thermostat controls summer temperatures by:

(a) Controlling a solenoid valve in the liquid line ahead of the thermal expansion valve to regulate the flow of refrigerant to the cooling coil. In this system the compressor is controlled by a low-pressure switch, and is commonly called a "pump-down" system. The General Controls K-15 and K-25 are typical solenoid valves for this application.

(b) Operating the compressor directly through the compressor motor contactor or starter. In two-stage systems, each stage, or compressor, should be independently controlled by the thermostat and an interlock should be provided so that the first stage must be operating before the second stage can be started.

(c) Starting and stopping the convector blowers individually or collectively, in a chilled water system.

(d) Operating a straight-through water valve in a chilled water system to control the

(Continued on next page)

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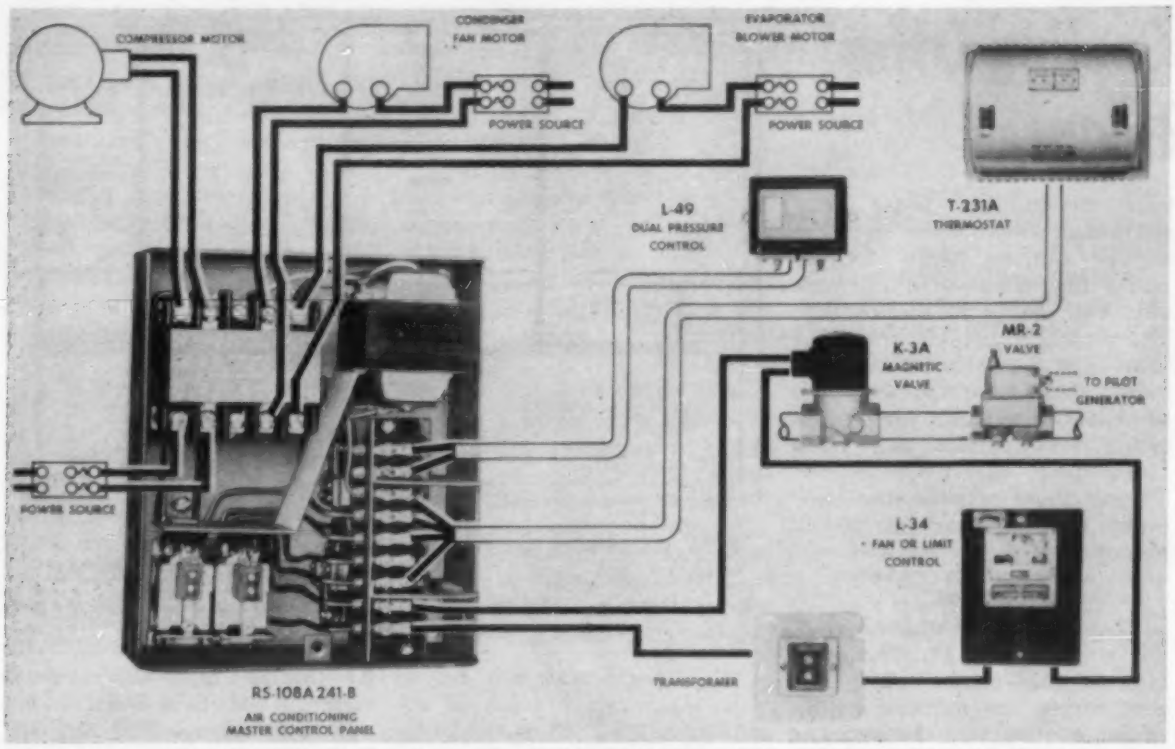


FIG. 6 shows a typical installation hookup for a year-round system incorporating a master control panel and employing gas.

How Residential Controls Function--

(Continued from preceding page)

flow of water to the cooling coil. This valve may be a solenoid valve or a motor-operated valve like the General Controls hydramotor valve.

(e) Operating a three-way valve to control the flow of chilled water to the cooling coil. This valve can also be either a solenoid valve or a motor-operated valve.

How Thermostat Controls Forced Air Furnaces Using Natural Fuel

For forced air furnaces using a natural fuel, desired winter (heating) temperatures are controlled by the room thermostat by:

(a) Controlling the flow of gas to the burner by opening or closing a gas valve in the gas line to the burner. This valve can either be a 24-volt valve or a self-energized or millivolt valve. Fig. 6 shows a typical control hookup for a year-round system using gas for heating.

(b) Controlling the operation of the oil burner through a stack switch or primary control. In addition, it often is desirable to operate a delayed-opening solenoid valve in the oil line.

In blower control, regardless of whether continuous or intermittent operation is selected during the heating season, the blower will normally be controlled by a fan and limit control, or a combination fan-limit control.

Wet Heating Systems Controls Explained

Wet heating systems are controlled in a number of ways. Commonly, the water temperature is maintained by an immersion aquastat which controls the gas or oil burner in the same manner as described above; and the room thermostat controls the operation of the circulating pump to maintain the desired temperature.

Dampers are sometimes used in both integral and packaged additive units to change the air flow. During the cooling season the air flow by-passes the furnace heat exchanger asnd passes over the cooling coil. In the heating season the reverse is true.

System Charged Manually

In some units this damper is manually operated, thus necessitating a trip to the unit every time the system is changed from heating to cooling to heating, which could be rather frequent during the changeable spring and fall seasons. Therefore, a damper control motor frequently is used to operate the damper, thus eliminating the labor and uncertainty of manual operation. This damper is controlled from the manual changeover switch of the room thermostat.

Damper Motor Control

If a low-voltage, two-wire, spring return damper motor is used, it can be controlled directly from the switch at the thermostat. If a two-wire, spring-return, line voltage damper motor is used, the thermostat switch controls a SPST relay, which in turn controls the damper motor. If a three-wire, line or low-voltage damper motor is used, the switch controls a SPDT relay, which in turn controls the damper motor.

(To Be Continued)

Will Duct System Balanced for Cooling Offer Correct Heating Temperature Balance?

NEW YORK CITY—If minimum temperature difference between rooms of a house is the criterion for proper balancing of a year-round system during winter heating, then some rebalancing may be necessary when changing from heating to cooling, according to D. R. Bahnfleth, research associate in mechanical engineering at the University of Illinois.

He bases his belief on studies made in Research Residence No. 2 at the university and described at the 42nd annual convention of the National Warm Air Heating and Air Conditioning Association here.

"One objective of this study was to determine whether a duct system which had been balanced for satisfactory cooling would also provide satisfactory heating temperature balance. This objective was extended to determine to what extent the system had to be readjusted to obtain satisfactory heating balance.

Effect of Cooling Air-Flow Rate

"Another objective of these studies was to determine what effect using the cooling air-flow rate would have on the comfort conditions in the Residence and also on the performance of the furnace and blower.

"In other words, when the cooling air-flow rate was used for heating in Research Residence No. 2 the system was no longer set for Continuous Air Circulation, and the studies were made to determine what effect this would have on the variation in room air temperatures," said Bahnfleth.

Description of Test House

The residence is a one-story frame structure with a full basement. The exposed walls, which are insulated with full thick mineral wool blanket-type insulation with vapor barrier attached, have an exterior finish of cedar shingles and ¼-in. plywood on the interior. The ceiling was fully insulated with mineral wool insulation.

The windows of the residence were all single-glazed and of the horizontal sliding type, except for the picture window in the living room which was double-glazed and fixed in place. The sliding windows were weatherstripped and equipped with storm sash. The doors of the residence, which are of wood and glass construction, were weatherstripped and fitted with storm doors.

The heat loss of the first story is 31,000 B.t.u.h. at an outdoor temperature of -10° F. The heat loss of the basement is 21,000 B.t.u.h.

The duct system was of the extended plenum type having uniformly sized trunk ducts and 4-in. diameter branch ducts. The nine 2¼-in. by 14-in. floor diffusers, which were used as supply outlets, were located under the windows at the outside wall except in the kitchen. The central return-air grille was located in the entrance hall.

The furnace, which was part of the year-round air conditioner, was gas fired and had a rated input of 70,000 B.t.u.h. During these studies, the fuel-input rate was set at 45,700 B.t.u.h.

4 Series of Studies

"To satisfy the objectives of the investigation, four series of studies were conducted. In the first series, the balance setting of the system was the same as it had been during the summer of 1954 and the air flow was set at the same rate used during the cooling studies.

"In the second series, the balance was changed by closing the valve in the kitchen diffuser, and since the blower speed was not changed, the resulting air flow rate was reduced in the third series of studies to obtain a 100° F. temperature rise through the furnace, but the balance adjustment was the same as that used in the second test series.

"In the fourth series, the duct volume dampers were adjusted to obtain a good heating balance with the kitchen diffuser valve closed and with the air-flow rate set for 100° F. temperature rise.

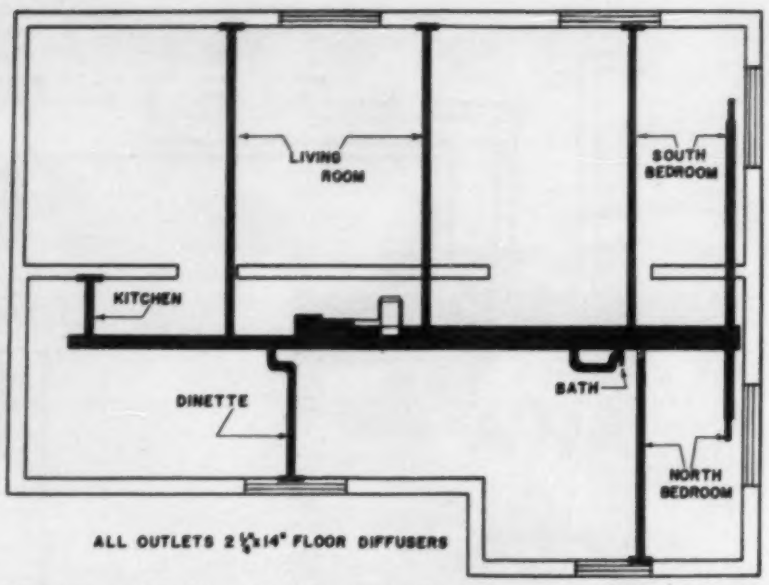


FIG. 1—Research Residence No. 2 basement plan and layout of small-pipe perimeter system used during 1954-55 heating season.

"The thermostat was set to maintain a temperature of approximately 72° F. at the 30-in. level in the house. The fan switch settings were: cut-on, 100° F., cut-off, 80° F., in all four series. The house was furnished and occupied during the investigation," Bahnfleth explained.

"It was found that the temperature balance maintained during the first study with the system balanced for cooling was not satisfactory since on most of the days the difference in the temperatures between the rooms having the highest and lowest room air temperatures was between 4° and 5° F. In severe weather the maximum temperature difference between rooms at the 30-in. level was as large as 6° F.

"The coarse balance adjustment obtained by closing the kitchen diffuser valve reduced the maximum temperature differences between rooms by about 1.5° F., and thus the temperature difference between rooms was then between 2.5° and 3.5° F.," he said.

Adjustment of Air-Flow Rate Was Helpful

"Further improvement in the balance was observed when the air flow rate was adjusted for a 100° F. rise through the furnace with the kitchen diffuser valve closed, and in this test series the maximum temperature difference between rooms was between 2° and 2.5° F.

"When the system was rebalanced for heating, the difference in temperature between rooms was reduced to 1.5° to

(Concluded on next page)

For more information about products advertised on this page use Information Center, page 66.

Balancing Ducts--

(Concluded from preceding page)

2° F., which was similar to that experienced with previous small pipe heating systems.

"Thus, the results indicated that some rebalancing of a year-round system may be necessary when changing from heating to cooling and also, that the closing of diffuser valves in those outlets required for cooling but not for heating would be effective in improving the comfort provided by the heating system," suggested Blahnfleth.

"A comparison of the floor-to-ceiling level temperature variations observed in each of the studies showed that using the cooling air-flow rate instead of that required for Continuous Air Circulation did not appreciably change temperature variations.

"For instance, the average floor-to-ceiling level temperature differential at an outdoor temperature of 0° F. was 3.2° F. when the system air-flow rate was 530 c.f.m., and 3.9° F. when the system air-flow rate was 300 c.f.m.

"When the outdoor temperature was about 40° F., the average floor-to-ceiling temperature differences were 1.5° and 2° F. for air-flow rates of 530 and 300 c.f.m., respectively," he explained.

Using the higher air-flow rate and consequently lower air temperature rises through the furnace in the first two studies did have an effect on the performance of the blower. In both cases, continuous operation of the blower did not occur until the outdoor temperature was below about 15° F., and a large number of blower operations occurred during the daytime and early evening period on days when the outdoor temperature was about 30° F.

"On the other hand, when the system was adjusted for Continuous Air Circulation, the blower operated continuously when the outdoor temperature was 30° F. The intermittent operation of the blower during the studies with the higher air-flow rates resulted in larger cyclic variations of room air temperature during the day. The cyclic variation of room air temperature was not effected by air-flow rate when the blower operated continuously," he said.

Cincinnati Redlegs To Air Condition Crosley Field Player Dugouts

CINCINNATI — Major league baseball players will rest in air conditioned comfort between innings here this summer.

Dugouts at Crosley Field will have air conditioning for the coming season, according to Gabe Paul, general manager of the Cincinnati Redlegs.

"The visiting club will have the same comforts our boys will have," Paul said. "It gets darned hot at times and we want all the players to be at their best."

Paul indicated that ball players have told him Cincinnati temperatures are among the highest in the 8-team National League.

"The air conditioning innovation will surely help the players to maintain their strength and it should result in better baseball for the fans," he added.

When asked how the pitchers might feel about moving into an air conditioned place (cooling off their arms), Paul stated that had been taken into consideration and dugouts would not be that chilly.

Then he was queried about player superstitions. Some baseball players prefer to enter the dugout by a certain route. How about that?

Paul declared he was thinking of their comfort and they would have to determine those matters themselves. He went on to say that he thought the Frigidaire air conditioning would meet with general player approval.

Much of the press box will also be air conditioned, he said.

MOUNTED in the Ford station wagons above are complete condensing unit and evaporator sections of Armstrong's 2-ton air-cooled residential air conditioner. These station wagons will be used for product demonstrations and exhibitions.

Armstrong Furnace Mounts Air Conditioning Demonstrators In Ford Station Wagons

COLUMBUS, Ohio — Armstrong Furnace Co. here has mounted the complete condensing units and evaporator sections of Armstrong's 2-ton air-cooled residential air conditioners on runners in the beds of two new Ford station wagons.

The units are mounted so they can easily be pulled into full view on the tail gates of the Fords. The automobiles will be used by Armstrong district managers D. S. Montgomery and John Irwin for product demonstrations and exhibitions.

COMPACT components for Shana air-cooled air conditioners are shown at left.

Shana Mfg. Adds 2 New Air-Cooled Conditioner Lines

CHICAGO—Two new complete lines of air-cooled air conditioning equipment have been added to the "Shana-Air" line, according to Harry G. Shaffer, president of Shana Mfg., Inc.

"We have concentrated on these new air-cooled lines because we know that the trend in 1956 will be toward waterless air conditioning equipment," he added.

"However, we have also completely redesigned our water-cooled series, and we now have 2, 3, 4, and 6-ton units available in pastel and metallic-trim cabinets," Shaffer said.

2 SERIES AIR-COOLED

The Shana air-cooled units are comprised of the SAAC series and the SAR series both in 2, 3, and 5-ton capacities. Both are designed for outdoor installation.

The SAR series is blower-driven so it may also be used for indoor application. The SAR series has a power-pak blower for moving large quantities of air to cool the condenser—and can be installed in attics, crawl spaces, utility rooms, breezeways, and garages.

SAAC series uses a propeller blade for outdoor application operating at low decibel level; a large face area condenser has air intake on two or three sides (two for 2 ton, three for 3 and 5 ton.), and discharges through horizontal fan blade in four directions.

Shaffer stated that the evaporator assemblies include convertible type design for horizontal or vertical installation, and the new "Inverted V" design for installations where space limitations necessitate compactness.

He added that the new SAR series features "Shana-Matic" couplings which eliminate the necessity of refrigerant charging in the field. Couplings and connective tubing are factory assembled, sealed, and pre-charged in 25 or 50-ft. sets. Evaporator and condensing assemblies are also pre-charged so that no special tools are required.

WEATHER-PROOFED

Both the SAAC and the SAR air-cooled series are weather-proofed, Shaffer said. All ratings are based at ASRE and ARI conditions, with sufficient power reserve to assure sustained operation when air conditioning requirements are the greatest.

The evaporator performs equally well for upflow or downflow systems, or when used for horizontal or vertical discharge. Air velocity may be varied without causing any radical change in sensible and latent cooling ratios.

Stephens Becomes Full-Line Carrier Outlet Sees Room Unit and Residential Tie In

MEMPHIS — Recently appointed wholesale distributor for Carrier room air conditioners and self-contained ice makers, Stephens Bros., Inc., staged a full-day meeting at Holiday Inn here in mid-February to introduce 1956 models and sales plans to dealers.

Addition of these two lines makes Stephens Bros. a full-line Carrier outlet, the firm having been a Carrier distributor-contractor on commercial and residential air conditioning and refrigeration since 1952.

Although Carrier generally keeps its room unit distribution separate from the commercial and residential lines, "we feel these people belong in the merchandising of room coolers," says Duncan J. Tutt, merchandise manager for Carrier's southern region.

"Anyone you sell a room unit to is a prospect for a central system," contends Spencer Stephens, vice president of the firm, who directs its wholesale activities.

Charles Stephens is president of the company.

Thomas Laney has joined the firm to head up direct merchandising of room units and ice makers.

William Counce is the sales manager.

At the sales meeting, factory and regional Carrier representatives outlined sales features and techniques on company products, the session being directed primarily at full-line dealers, according to the report.

4 Regional Meetings Held by C. A. Dunham

CHICAGO—Sales representatives of C. A. Dunham Co. here, manufacturer of heating and cooling equipment, attended four regional sales meetings held in Chicago, New York City, Memphis, and Salt Lake City.

One of the main subjects dealt with a demonstration of Dunham's new "Vari-Air" system in action. This system has been developed for heating, ventilating, and cooling schools and public buildings. Other topics were the company's extended sales program and new advertising plans for 1956.

Main speakers at the meetings were W. S. Browning, vice president, sales; N. F. Sorgenfrei, sales manager; Lewis Smith, sales specialist; J. S. Gregory, assistant sales manager; and E. C. Jepson, advertising manager.

For more information about products advertised on this page use Information Center, page 66.

Willis Halts Retailing, Installing Conditioners; Employes Form Willison Retail Contractor Agency

AKRON, Ohio—Dan H. Willis Co., which for several years has been wholesaling, retailing, and installing air conditioning and automatic heating equipment, has announced that its business is now entirely wholesale.

At the same time, it was announced that a group of former Willis employes have incorporated an engineering, service, and sales company which will function as an industrial contracting and retail air conditioning and heating agency. The new firm, named The Willison Co., is presently located at 135 W. Market St.

Dan H. Willis Co. said salesmen with engineering training will represent it to dealers in the air conditioning business in the Akron-Canton-Youngstown area, including 14 Ohio counties.

The Willis company is the exclusive distributor for Carrier air conditioning and refrigeration and Iron Fireman gas and oil heating equipment. For the new, exclusively wholesale activities, a number of allied lines will be added. The company said it will render a complete sales assistance and merchandising program for dealers.

The new Willison Co. will engage in all phases of air conditioning — "industrial installations up to 500 tons cooling capacity, as well as home air conditioning from a single room to the complete house," it was pointed out. "Gas and oil heating for industrial, commercial, and home use will also be engineered and installed."

The Engineering and Industrial Sales Department will operate as a separate division. It is headed by James Markwald, registered engineer, with over 20 years' experience in air conditioning, refrigeration, heating.

With him are Stanley J. Lero, a graduate engineer with over eight years' experience, and S. Palmer, with similar length of experience.

Paul R. Mumma, president and service manager, with John Pacenta, treasurer and sales, are both veterans in the air conditioning field.

Berna Moves to New Bldg.

GARWOOD, N. J. — Berna Corp. has moved from Richmond Hill, N. Y. to its new building at 251 North Ave. here, the company announced recently.

Telephone number at the new location is Sunset 9-1620-1. The company requests that all mail be set to P. O. Box #66, Garwood, and all packages and freight to the building address.

Electrostatic Precipitation, Engineering, Electrical Contacts Seminars Due In June

UNIVERSITY PARK, Pa.— Seminars on electrostatic precipitation equipment, creative engineering, and electrical contacts will be held at The Pennsylvania State university during June.

A seminar primarily for engineers responsible for the operations of electrostatic precipitation equipment is scheduled for June 11-15.

During the first day and one-half, Dr. H. J. White of Research- Cottrell, Inc. will discuss the principles underlying the electrostatic precipitation process.

The remainder of the seminar will be concerned with several areas of electrostatic precipitator applications: public utilities, the steel industry, air cleaning for air conditioning, and other uses.

Among the speakers will be Prof. G. W. Penney of Carnegie Institute of Technology. Papers will be presented by persons from such organizations as the Koppers Co., Inc., Raytheon Mfg. Co., and Western Precipitation Corp.

Small discussion groups will be arranged around specific problems in electrostatic precipitation, with one or more qualified resource persons sitting with each group. R. E. Armington, assistant professor of electrical engineering at Penn State, is seminar chairman.

A creative engineering seminar "to provide information on those procedures and principles which can assist in the production of new and fruitful ideas" will be held June 17-22.

The program is intended for engineers working in development, research, promotion, and product design. Registrants will be urged to bring "company problems," so they can be presented and analyzed.

Maurice S. Gjesdahl, professor of mechanical engineering at Penn State, will be in charge of the seminar. Among guest lecturers will be James H. Carpenter, Carrier Corp.; C. F. Hix, Jr., General Electric Co.; and B. O. Austin, Westinghouse Electric Corp.

A seminar on the fundamentals and applications of electrical contacts will be held for scientists and those experienced in this field on June 25-29.

During the first two days, Dr. Ragnar Holm, consultant physicist for Stackpole Carbon Co., will conduct a review on the physical principles of electrical contacts.

Electrical contact applications will be stressed during the balance of the seminar. In addition, scientists and engineers, involved either in the manufacture or in the use of electrical contacts, will present individual papers.

Another feature of the seminar will be the small group discussions on specific electrical contact problems, with one or more resource men sitting with the group.

Acme Appoints Merrill Eastern Regional Mgr.

JACKSON, Mich. — Appointment of Duane G. Merrill as eastern regional manager is announced by Acme Industries, Inc. here, manufacturer of a complete line of air conditioning and refrigeration equipment.

D. G. Merrill

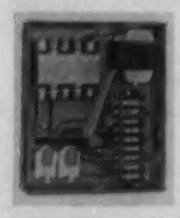
Merrill joined Acme in 1947 as a sales engineer, advancing to the position of manager of the sales engineering department in 1950. Then, 18 months later, he was named assistant sales manager.

In 1954, Merrill was named assistant to the general manager, followed by his appointment as manager of sales service.

For more information about products advertised on this page use Information Center, page 66.

Control Panel Is for Central Heating, Cooling

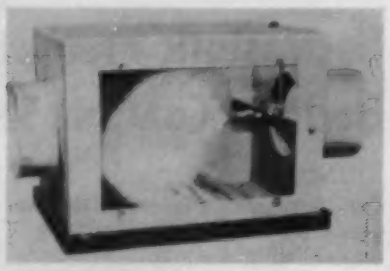
KEY NO. F-3217



GLENDALE, Calif. — A new master control panel (RS-108) providing automatic centralized control of central heating and cooling systems, was announced recently by General Controls Co.

All components, including transformer, relays, pressure switches, motor contactors, and other electrical controls, are located in the new General Controls unit.

Standard models are available in various contactor ratings, with and without integral dual pressure control, manual, automatic, or remote electrical reset after tripout; operating relays and motor starting relays for use on refrigeration units or on combination heating and cooling equipment.



Lennox Offers Spray Humidifier for Homes

KEY NO. F-3218

MARSHALLTOWN, Iowa — A new high-capacity spray humidifier introduced by Lennox Industries, Inc. is designed to maintain healthful humidity conditions in large new homes or in older homes suffering from cold-air leakage.

Easily attached to any warm-air furnace, the humidifier adds up to 18 gals. of water per day to the air, the company said.

The unit features a continuous-flow spray located in a by-pass between the warm-air and return-air furnace plenums.

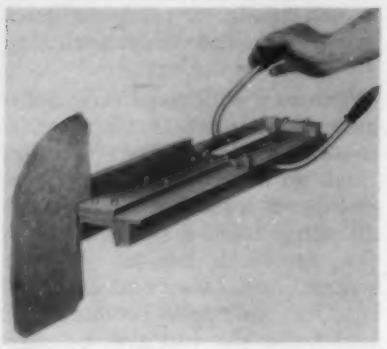
'Pump-Aid' Developed for Seasonally Used Pumps

KEY NO. F-3219

ST. LOUIS—Garman Co., Inc. here recently announced production of a new product used to prevent sticking of seasonally operated pumps such as those in air conditioning recirculating equipment, auxiliary pumps, etc.

"Pump-Aid" is said to protect against corrosion and other "down" period problems. It is injected under pressure through the drain hole into the pump housing cavity immediately after draining the pump. Supplied in aerosol canister using fluorinated hydrocarbon ("Freon") type propellent, Pump-Aid is sprayed over all surfaces to allow the pump impeller to turn freely, according to the manufacturer.

The firm claims that the product will not freeze, evaporate, needs no special job preparation to use, adheres until flushed off, and is water soluble. It is also said to be non-toxic.



Cheek Bender Eliminates Much Hand Labor

KEY NO. F-3220

HOPKINS, Minn.—A mechanical device called a "Cheek Bender," claimed to eliminate much hand labor in production of elbows and other fittings, is being offered by Bett-Marr Mfg. Co. here.

Able to accommodate up to 20-gauge metal, the unit has a 12-in. throat, weighs 41 lbs. Changeable strips make the Cheek Bender adjustable for bends in varying widths. It comes equipped with strips for ¼ and ⅝-in. bends. Strips for ⅜ and ½-in. bends are also available, the company declared.

Installation is simple, according to the manufacturer. It comes with two lag bolts furnished, ready to set up on the bench. The machine is finished in gray hammer finish.

Dehumidifier Heats, Circulates Air

KEY NO. F-3221

CHICAGO—A high efficiency dehumidifier which circulates and heats as well as removes water from the air has been introduced for 1956 by The Mitchell Mfg. Co. here.

Many new features are included on Mitchell's "Imperial" model, one of which is a "humidity dial" which constantly reads the humidity in the rooms and tells when to turn the unit on or off.

Other features are: a four-position switch for "circulate," "dehumidify," "heat," and "off"; "Dyna-System" air dryer which removes from 2 to 3 gals. of water from a room in 24 hours depending on the conditions of temperature and humidity; supplementary, 1,000-watt heating coil; a high-speed circulating fan.

The Mitchell dehumidifier also has a three way water disposal consisting of a non-rusting, easy to empty container, a hose connection for disposal through a drain, and provisions for the collecting pan to deposit water directly when the unit is located over a drain. Also, a filter to remove dust and foreign particles from the air.

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2 PVC Refrigeration Pipes Introduced

——KEY NO. F-3211——

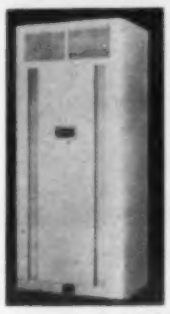
UNION, N. J.—Now marketed by Alloy Tube Div. of Carpenter Steel Co. here is a rigid unplasticized PVC (polyvinyl chloride) pipe for refrigeration uses.

Two types of PVC are offered. One is a normal impact grade with high chemical resistance, the other a high impact grade with slightly less chemical resistance, but greater strength, the firm reported. Threaded and socket types of fittings are available in both.

Available in schedules 40 and 80 in nominal sizes ranging from ⅛ to 4 in., the pipe is furnished in standard 10 and 20-ft. lengths.

Air Conditioner Offered For Meat Cutting Room

——KEY NO. F-3212——



BROOKLYN—Typhoon Air Conditioning Co. now has an "exclusive" meat cutting room air conditioner — model H 86 SC - White— especially designed for supermarket meat cutting rooms.

Available in 3, 5, and 8-ton capacities, the air conditioner features a "smooth, easy - to - keep - clean baked white enamel finish," it was stated.

Don V. Petrone, president, points out that this Typhoon unit is engineered for lower than normal temperatures by means of an additional low temperature limit cutoff which prevents freeze-up.

Incorporated in the unit is Typhoon's new all copper jet counterflow condenser.

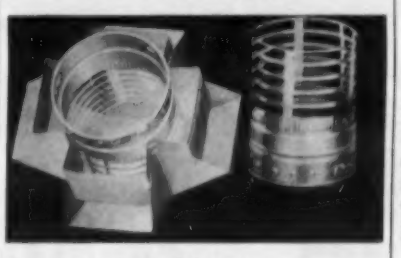
Condensate Disposal Pump Developed

——KEY NO. F-3213——

SPRINGFIELD GARDENS, N. Y.—Kesco Products Corp. here recently introduced a new 110-220 v. 20-ft. head automatic condensate disposal pump, it was announced.

Featuring an all-welded heavy hot-dipped galvanized 3-gal. tank with 2-gal. reservoir, the reservoir remains empty at all times to receive additional suspended water released when electricity to air conditioner and pump is disconnected or fails, the company declared.

Other features include two ¾ pipe-threaded inlets located 1½ in. from the floor and a double pole switch which starts the pump when water level reaches about 4 in.



Interior Grille Bars Debris from Vents

——KEY NO. F-3214——

BELMONT, Calif. — William Wallace Co. here recently introduced an improved "Belmont Top" with an interior grille which bars nesting birds and accumulating debris from external gas vent openings, the manufacturer announced.

The grille is available in all Belmont Tops from 3 to 8 in. in diameter to act as a filter to prevent twigs, leaves, paper, and birds from clogging the discharge opening, the firm pointed out.

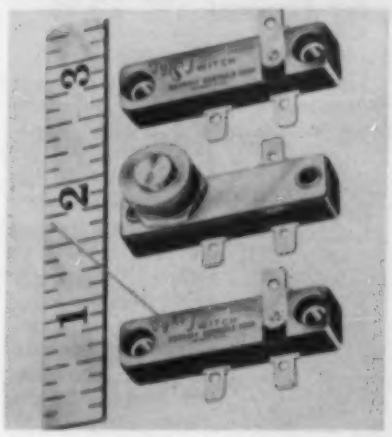
Detroit Controls Produces Snap-Action Switch

——KEY NO. F-3215——

DETROIT — A compact, fully-enclosed snap-action switch was introduced here recently by Detroit Controls Corp., the manufacturer announced.

"TyniSwitch" is 1⅝ in. long, 9/32 in. thick, and 7/16 in. wide. Connecting elements in the spring release mechanism are eliminated and there is only one moving part.

Claimed to have precision performance and long contact life, the switch has applications in appliances, clock-timers, office equipment, vending machines, electronic, automotive, instrument, and automation fields.



Titus Designs One-Piece Air Return Grille

——KEY NO. F-3216——

WATERLOO, Iowa — What is called a new departure in the design and manufacture of return air grilles has been announced by Titus Mfg. Corp. here.

The company's engineering department has developed a new grille featuring one piece assembly —for any size opening.

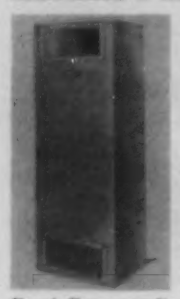
"It eliminates butting together of smaller grilles," the company said. "There is no extra work in fitting or assembly.

For more information about products advertised on this page use Information Center, page 66.

Conditioner Controlled By Freezer Off-Cycle

——KEY NO. F-320——

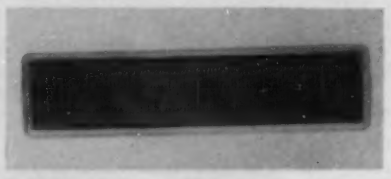
INDIANAPOLIS — General Equipment Sales, Inc. here has introduced a new, low cost "Sani-Air Conditioner" as part of its 1956 line of "Sani-Serv" soft ice cream freezers.



The company said the air conditioner is designed to operate from the condensing unit of the giant "Super 6" Sani-Serv soft ice cream freezer.

"The cooling cycle of the Sani-Air Conditioner is timed to operate when the Sani-Serv refrigeration unit is on 'off cycle,'" it was explained. "When the Sani-Serv freezer cycles on again, the air conditioner shuts off, diverting maximum refrigeration to the freezer.

"Continuous controlled cooling of the serving room during the mornings and afternoons, plus intermittent Sani-Air Conditioning during peak evening hours, maintains comfortable temperatures."



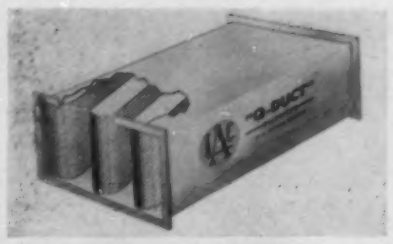
Return Air Grilles Blend with Decor

——KEY NO. F-321——

COOPERSVILLE, Mich.—A new line of air conditioning return air grilles, styled to blend with any modern room interior, has been announced by Air Control Products, Inc. here.

Designated the No. 21 and No. 23, models are available for either sidewall or baseboard grille installations. They have vertical fins.

Six sizes of grilles are available in either product series, from 8 by 6 to 30 by 6.



Duct Silencing Units Developed by IAC

——KEY NO. F-322——

NEW YORK CITY—Packaged standard silencing units for air conditioning ducts have been announced by Industrial Acoustics Co., Inc. here.

Through the development of the I.A.C. "Q-Duct" silencing system, these prefabricated standardized Q-Ducts can be fitted into the air conditioning system during the design stage of the installation, the company said.

This is made possible by the fact that the Q-Ducts are available in 148 sizes to meet every dimension and performance requirement, it added. Acoustic noise reduction curves as well as pressure drop data are available for each unit.

The I.A.C. Q-Duct system was developed from the I.A.C. "Acou-Stack" silencing system which had originally been developed for use in aviation test cell silencing installations to meet the high noise reduction requirements of high powered jet and turbo-prop engines.

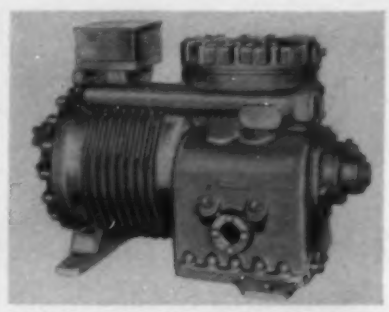
Suction Gas-Cooled Compressor Introduced

——KEY NO. F-323——

SIDNEY, Ohio—A new addition to Copeland Refrigeration's "Copelametic" motor-compressor line is the suction gas-cooled 10-hp. model 9R8-1000, designed for air conditioning application.

The new compressor measures 27 3/16 in. long, 18 1/2 in. high (on springs), and 14 in. wide.

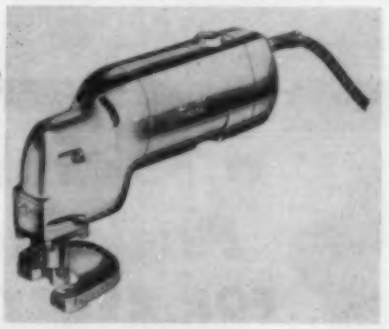
"C.F.H. displacement is 1,375.0 at 1.750 r.p.m.," the company said. "Design includes three cylinders



with bore 2 3/16 in., stroke 2 in. Refrigerant is 'F-22.' Low weight to horsepower ratio is achieved with the net weight of 337 lbs.

"The use of refrigerant to cool the motor windings eliminates compressor cooling fans or water connections for a completely waterless installation.

"Its compact design permits easy installation in packaged or remote air conditioner condensing units in the 10-hp. size. Also, it can readily be used in combinations for packaged air conditioners of virtually any size."



Mall Tool Designs Electric Shears

——KEY NO. F-324——

CHICAGO—Mall Tool Co. here recently announced a newly-designed electric metal shears.

Powered by a universal-type motor, the electric shears has a cutting capacity of up to 16-gauge steel, it is claimed.

This Mall unit has a stroke length of 3/32 in. at 2,500 strokes per min. Designed to cut up to .06 in. thickness, minimum radius of circle is 1 in., but smaller diameters can be cut in softer and thinner materials counter-clockwise, it was added.

Switch is operated by squeezing the tool and depressing the paddle for one-hand operation.

Niagara Adds 9 Metal Snips and Shears

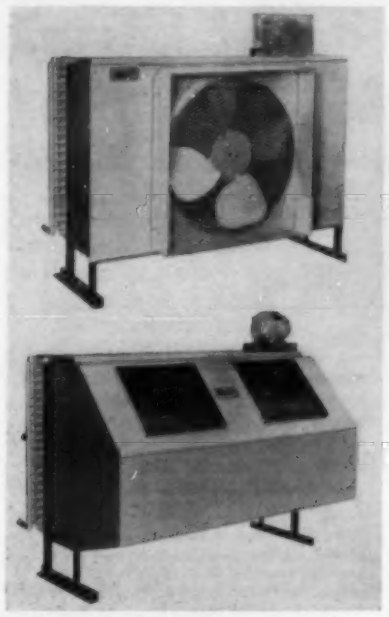
——KEY NO. F-325——

BUFFALO — Nine new sheet metalworker's snips and shears were recently added to the Niagara Machine & Tool Works line.

There are three new "Compound Leverage Shears" (for straight, right, and left cuts), three new "Straight Snips," and three new "Combination Snips."

Compound Leverage shears multiply hand pressure in cutting up to 18-gauge steel with steel jaws curved to divert sheared metal from the 52 serrations per in.

For more information about products advertised on this page use Information Center, page 66.



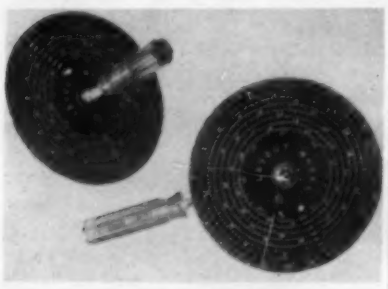
Bush Blower Condensers Offer Waterless Cooling

KEY NO. F-326

WEST HARTFORD, Conn.—Operation of air conditioning and refrigeration systems without the use of water is possible with a new line of "BC" blower condensers introduced by Bush Mfg. Co., the company has announced.

Available in capacities up to 20 tons, the new Bush units are said to feature low noise level and quiet operation. Other features include patented Bush "Inner-Fin" coil construction, easy installation, and all-steel cases with rust-resistant finish.

The blower condensers are available arranged with either blower fan for indoor installations or propeller fan as desired.



Layout Wheel Converts Diameter-Circumference

KEY NO. F-327

SANTA MONICA, Calif. — A "layout" wheel that provides both a measuring wheel and a conversion chart on the face of the wheel for quickly converting from diameter to circumference or from circumference to diameter, has been announced by the Idex Mfg. Co. here.

The wheel is calibrated in inches around its circumference. Also, the wheel contains a number of concentric circles which are graduated in diameter figures.

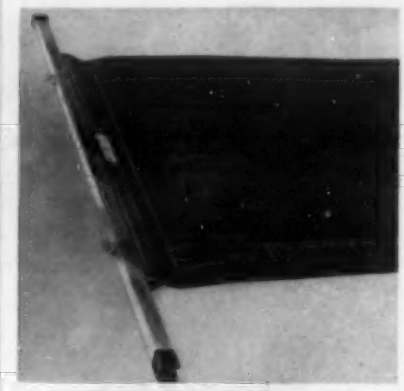
A radial pointer is movable over the face of the wheel so that the side of the pointer can select the desired diameter on one of the concentric circles and the corresponding circumference can be read at the pointer on the scale around the wheel circumference.

The pointer carries a figure opposite each of the concentric circles, so that the figure on the pointer opposite the diameter circle is added to the reading on the circumference scale to obtain the total circumference.

The layout wheel provides a means for quick calculation and layout of tubular constructions and gives a permanent record of the conversion figure, the company said.

The scale on the circumference of the wheel can be utilized to check the circumference of ducts or pipes which have already been constructed.

Holder Can Handle Up to 150 Plans, Blueprints



KEY NO. F-328

SOUTH GATE, Calif. — "Plan Hold," a new device for holding building or engineering plans, has been introduced by the Plan Hold Div. of Air Comfort Co.

The holder has been designed to fit any existing plan rack or file and will hold one or 150 prints securely without the necessity of punching or drilling holes or mutilating plans, according to the company. Prints may be added or removed without disturbing other prints.

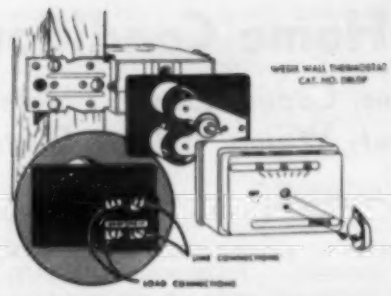
Loosen two wing nuts and the Plan Hold snaps open. Tighten the nuts and the prints will not slip. Wing nuts and studs are located on the end of the holder and are never in contact with plans or prints.

The holder is made of satin-finished aluminum and corners and edges are rounded. Soft plastic tips protect against scratching or marring of desks and reference tables, the company claims.

Wesix Produces Sensitive Thermostat, Switch

KEY NO. F-329

SAN FRANCISCO—A sensitive line voltage thermostat and two pole switch for direct control of electric heating cable, non-automatic heaters, duct heaters, and other such units, was recently introduced by Wesix Electric Heater Co. here.



Wesix DBL-DP is sensitive to a temperature change of plus or minus 1°, according to the manufacturer. It is rated at 25 amps, 240 v., with a range of 55 to 85°. It features heavy silver contacts and twin bi-metal coils with combined length of 12 in. Controlled heat feedback powers the thermostatic action and time cycle the power to the heating unit.

The thermostat of the UL approved case measures 3 by 4½ in. In the off position the switch breaks both sides of the line.

Sidewall Perimeter Diffuser Offered

KEY NO. F-3210

CLEVELAND—A new sidewall type perimeter diffuser, which "blankets entire walls with a curtain of warm air," is ideal for use in heating or combination heating-cooling systems, according to the Auer Register Co. here.

Known as "Fanaire," the diffuser can be installed close to floor level providing an upward floor-to-ceiling fan-shaped air pattern, while up-side-down installation enables ceiling-to-floor coverage.

Tips To Avoid Home Conditioning Pitfalls:

Follow Instructions, Codes, Locate, Isolate Equipment, Size Lines, Check Refrigerant, Wiring, Balance Ducts—Advice To Installers

ATLANTIC CITY, N. J.— Tips on how to avoid some of the pitfalls in air conditioning the home were offered at the annual convention of the Refrigeration Service Engineers Society by William Tyson, technical service manager, Unitary Equipment Div., Carrier Corp.

What Not To Do

In discussing these pitfalls, Tyson first took a reverse approach and pointed out what not to do. He did this by relating on-the-job actions of a mythical heating and air conditioning man, "Joe McFlub," who "has the amazing faculty of doing things wrong."

Tyson then stated: "Of course, you realize that 'Flub' was a mythical character only because everything he did was wrong. He would have been just as much a mythical character if he had done everything right. Neither of these extremes I'm sure exist in any one individual.

"Do not get the mistaken idea that Flub's experiences are not real. On the contrary, they are very real and are occurring every day. Since their importance cannot be over-emphasized, I would like to review his experiences with you and point out how he might have avoided these pitfalls had he used better judgment."

Topics discussed by Tyson included instructions, equipment location, refrigerant piping, ductwork and air distribution, thermostat location, and miscellaneous matters.

"Probably the most serious mistake that was made by our mythical man was his failure to read the instructions and to follow them," Tyson said. "Instead, he elected to throw them away with other important materials and take his chances on getting by.

Failure To Read Instructions Is Very Costly Approach

"This is usually a very costly approach, not only in time and materials but in customer satisfaction and goodwill. There is nothing more frightening than ignorance in action.

"Installation and service instructions are not the most interesting reading material, but believe me they are essential to your business, particularly if you expect to make a decent profit. They reflect the experiences of many individuals which are passed on for your guidance.

"The warranty certificate is the manufacturer's contract with the customer. It obligates the manufacturer to do certain things. It is the property of the customer because he paid for it in the price of the equipment. You have no right to throw it away.

Present Warranty

"To the contrary, it should be presented to the customer with the equipment and its contents or coverage explained in detail. This applies also to the operators or owners instructions which are usually supplied in the same packet.

"The warranty record card is further protection for your customer when properly filled in and returned to the manufacturer. When registered with the manufacturer it establishes the warranty period. It also serves as a basis for maintaining quality products at reasonable prices.

"Manufacturers spend a great deal of time and money developing these materials. They all have a definite purpose. Let's use them as intended and avoid mistakes which could wipe out your profits on the job."

Tyson next discussed equipment location.

Use Good Judgment In Locating Equipment

"The use of good judgment in selecting the equipment location pays off in more ways than one. 'Flub's' decision to locate the oil-fired warm air furnace in the center of the basement was just a bit ridiculous and had its ill effects.

"The customer, of course, was very unhappy because it ruined any plans he might have had for a nice playroom and a workshop. It resulted in a much longer run of flue pipe to reach the chimney than should have been necessary and required more hangers for adequate support.

"It also made it much more difficult to secure the recommended pitch in the flue pipe. This pipe should always be pitched upward toward the chimney. You will recall that 'Flub' had the flue pitched downward toward the chimney and no draft regulator. Here we had better give him the benefit of the doubt since the draft regulator may have been integral with the furnace.

Might Need Induced Draft Fan

"There is a good possibility that an induced draft fan might have to be installed to obtain adequate draft for proper operation because of the long run of flue pipe. There is also danger of condensation of the flue gases which could cause considerable trouble.

"Of course, all of these things apply equally to a gas-fired unit, except that a draft diverter must be used with gas-fired equipment thus eliminating the need for a draft regulator.

"Since we are discussing the location of heating equipment, consideration should be given to installations in a confined space, such as a closet or utility room.

"We had an example of this type of installation when our little man took us across town.

(Continued on next page)

For more information about products advertised on this page use Information Center, page 66.

Careful Selection of Equipment Location, Clearance Essential

(Continued from preceding page)

It was a packaged year-round air conditioning unit with a heating section located in a small utility closet.

"There was a small vent in the door and the lady was complaining that the unit would not keep running. This is understandable as the closet was not properly vented.

"When a heating unit is installed in a closet, small room, or a building of relatively air tight construction, two openings to the furnace area must be provided: One located above the draft diverter relief opening and one below the combustion air opening to the furnace.

"The free area of each opening should be at least equal to 1 sq. in. for each 1,000 B.t.u./hr. input and never less than 200 sq. in. This will prevent flue gases from blanketing the room and extinguishing the flame in the burner.

"There are other types of heating equipment such as horizontal and counterflow. These require special consideration in their application and mounting which we will not attempt to cover here. However, before we leave the subject of heating I have three specific recommendations:

3 Recommendations

"1. Follow the installation instructions furnished with the equipment.

"2. Consult the manufacturer on special applications.

"3. Always check and observe all local building codes and ordinances which may apply.

"When locating a packaged year-round unit or other air conditioning components about the home it is important that they be isolated from the building structure. If this procedure is not carefully followed a noise problem is bound to develop.

"It is recommended that an isolation pad be placed between the unit and its base on all installations except where it rests on concrete. Materials such as sponge rubber and corrugated rubber matting are excellent for this purpose.

Avoid Using Material That Gives Off Odor

"However, anything that will deteriorate and give off odors when wet, as would occur outdoors or on floors that are mopped regularly, should be avoided. When a component or unit must be suspended special isolation hangers should be considered.

"Outdoor locations for items such as air-cooled condensing units, air-cooled condensers, and cooling towers must be carefully selected. Any air-handling equipment normally operated without ductwork is directional insofar as noise is concerned. Therefore, every consideration should be given to positioning the unit so that it will be the least objectionable to the neighbors.

"It may be advisable at times to shield the unit in some manner or add a short piece of ductwork to correct the condition. After all, your customer must live with his neighbors and they may not be able to afford air conditioning, which makes it even worse.

"Since you are all keenly interested in service you will realize the importance of adequate clearance around the equipment. Any item or component needing periodic attention should be readily accessible. Remember you are responsible for service during the warranty period and you owe it to your customer to keep his charges to a minimum after the warranty has expired."

Taking up refrigerant piping, Tyson stated:

"Refrigerant piping in a packaged unit presents very few, if any, field problems because it is factory engineered, assembled, and tested. This is not true of the summer air conditioners, of the conversion or fan-coil type.

Quality Depends on Installer's Skill

"Even though matching components are available the installation of the interconnecting refrigerant piping and accessories, where required, must be made in the field. Therefore, the quality of the installation and its ability to perform satisfactorily depends on the knowledge, skill, and ability of the installation men.

"This is not a new concept and to those of you who have had commercial experience this should present no real problems because the underlying principles and piping procedures are the same. In effect it is nothing more than a small commercial job.

"Time will not permit a discussion of refrigerant piping in all its details so we will have to confine ourselves to the actual requirements of the residential field.

Sizing Refrigerant Lines Is Very Important

"Sizing of the refrigerant lines is very important. It is common practice to size refrigerant lines for a pressure drop equivalent to a temperature of 2° F. In most cases this will insure adequate oil return through the suction line and the flow of refrigerant through the liquid line without the danger of flash gas velocities in suction line

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Sight Glass Recommended To Check Refrigerant Condition

(Continued from preceding page)

risers to insure adequate oil return.

"Line sizing charts for all refrigerants with instructions for their use are available from practically all manufacturers. Similar charts have been included in the RSES All Makes Service Manual. Usually this job is done for you by the manufacturer and recommended sizes for various lengths are included in the installation instructions furnished with the equipment.

Good Practice To Loop Suction Line Up Near Top of Evaporator

"It is always good practice to loop the suction line upward near the evaporator. This loop should extend at least to the top of the evaporator. It prevents liquid refrigerant from draining by gravity to the compressor during the off cycle, should the expansion valve fail to close off completely.

"Pump down control is recommended by some manufacturers to prevent oil dilution at start-up which would cause excessive wear and premature failure of the compressor. This is a function of the refrigerant to oil ratio in the system and varies with the type of equipment and length of refrigerant lines. Here again it is important that manufacturer's recommendations be carefully followed.

"Usually the major components of the system are evacuated and dehydrated at the factory and are either shipped with a holding charge or possibly a complete charge of refrigerant. This then leaves only the interconnecting piping to be taken care of in the field.

"If normal care is exercised during installation a good dehydrator in the liquid line will prove adequate for moisture removal and the air can be eliminated by purging the lines with refrigerant.

"There seems to be a divided opinion on the desirability and need for a sight glass in the liquid line. I personally feel a good sight glass is desirable and useful if installed near the expansion valve.

Determine Refrigerant Condition at Glance

"The condition of the refrigerant entering the expansion valve can be determined at a glance. A solid sight glass indicates a full charge and everything should be satisfactory at least to the expansion valve. Bubbles in the sight glass means either a low refrigerant charge or flashing in the liquid line due to pressure or excessive liquid lift. By the process of elimination the trouble can be located quickly.

"I'm sure 'Flub' would agree with me. It would have saved him the trouble of replacing an expansion valve as well as the cost of a charge of refrigerant.

Expansion Valve Often Wrongfully Accused

"This brings us to the expansion valve which is quite often wrongfully accused of misbehavior. Here again is a broad subject and we can't possibly cover it completely. However, there are several points that should be stressed.

"1. Replace an expansion valve as a last resort, and only after you have determined that it is not functioning properly. Records indicate that a very high percentage of expansion valves removed in the field are in perfect operating condition.

"2. The thermal element should be securely fastened to a straight run of suction line as near the evaporator as possible. Don't try to fasten it to an elbow as we found 'Flub' had done on one of his systems.

"3. If it is necessary to remove the expansion valve from a packaged type unit be sure to replace it with an identical valve. In most cases the valve installed in the unit will not match the selection from the published expansion valve catalogs. Substitution should never be made without checking with the unit manufacturer.

Insulate, Waterproof Suction Lines on Remote Type System

"Suction lines on a remote type installation should always be insulated and waterproofed to prevent condensation and dripping. Any section of an insulated line exposed to the elements should be further weatherproofed.

"When running the refrigerant lines between the various components the following precautions should be taken to prevent noisy installations.

Prevent Noisy Installations By Following Precautions

"1. Use isolation type hangers when it is necessary to fasten the refrigerant lines to floor joists or other framing in the structure. Rigidly fastening the lines will cause pulsation to be transmitted to the structure, creating an objectionable rumble.

"2. Isolate the lines where they run through a wall or sill. The insulation on the suction line will serve to isolate the line. Other lines can be isolated by insulation at such points also.

"3. Isolate refrigerant lines from all ductwork.

"4. Do not attach liquid line to uninsulated suction line. A rattle may develop. Also with a hermetic compressor too high a superheat in the suction gas may result, causing overheating of the motor and possible failure."

Turning to ductwork and air distribution, Tyson said:

Good Ductwork System Is Very Important

"A good system of ductwork is very important in air conditioning the home. The measure of performance usually used in the home is the temperature differential from room to room. This, of course, is a direct indication of how well the air is being distributed.

"When too wide a temperature difference exists invariably it is due to either poor duct design or improper system balance. We cannot go into duct design here. Therefore, we will assume an adequate duct system as we look into the problem of air distribution and system balance. It must be remembered that good duct design must include the necessary dampers or facilities required for good air distribution or balance.

"From the load estimate, the actual air requirements for each

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For more information about products advertised on this page use Information Center, page 66.

Maintain Adequate Electrical System, Proper Refrigerant, Hermetic Service

(Concluded from preceding page)

room are calculated. Using this calculated c.f.m. the grilles and registers are selected.

"The common practice is to adjust the damper in the duct system so that the calculated amount of air is delivered at the registers. This often required considerable time and effort, with precision instruments.

"This would be ideal if the load estimates and design calculations were accurate. Usually estimates cannot be made that closely. It then becomes necessary to readjust air quantities to meet actual requirements.

Compensate for Errors By Air Balancing

"The only purpose of air balancing is to compensate for minor errors in estimates and ensuing calculations. Therefore, with a good duct design, it would appear that this initial time consuming job of balancing might be eliminated since most of the settings had to be changed anyway.

"Some installers are advocating that dampers be temporarily adjusted at the start and balancing be done only at the request of the owner. This approach has a lot of merit because it results in no more call backs than formerly.

"Good air distribution in the living space is the ultimate aim, and the quantity of air delivered is a very important factor. However, there are other factors that are equally important; such as the number, type, and location of supply registers and return grilles.

"Location or relocation of furniture can also have serious effects on room conditions. The control of this problem is pretty much in the hands of the customer and at times is rather difficult to cope with.

Register, Grille Location Is Very Controversial

"The location of registers and grilles is a very controversial subject and always will be. It varies with type of construction, geographical location, type of equipment, and the whims of the installer. Generally speaking the type of register is more important than the location."

Regarding thermostat location, Tyson stated:

"Extreme care should be exercised in locating the thermostat. Its only function is to start and stop the equipment when it senses a temperature change.

"It should be mounted where it will reflect the true temperature of the room or area to be called. It should not be located on an outside wall, over a warm air duct, in the path of outlet air, over a TV set, or near any heat producing appliances which may affect it. Here again it is necessary to do an educational job on the customer in order to cope with the situation fully.

Miscellaneous Items Cause Confusion

"There are a number of miscellaneous items that generally cause a great deal of confusion," Tyson continued. "Heading the list of these is the electrical wiring with all of its ramifications.

"An adequate source of power must be available. Excessive variations in voltage and phase unbalance cannot be tolerated. Adequate wire sizes and fuses are a must. Safety must be carefully considered in the wiring of controls whether high or low voltage.

"The utilities are usually very cooperative in correcting any deficiencies found in the power source.

"Manufacturers usually supply detailed information on wiring their products. The installation instructions invariably contain complete wiring diagrams as well as wire and fuse sizes. These recommendations should be followed carefully. It goes without saying, that all wiring should conform to national and local codes.

"Refrigerants account for their share of the confusion that exists. Nomenclature, mixing, and the substitution of refrigerants offer the most serious problems.

"The nomenclature of refrigerants is an industry problem and eventually will be resolved. In the meantime, we should thoroughly familiarize ourselves with the trade names of the refrigerants and their chemical formulas.

"The substitution and mixing of refrigerants should be avoided unless proper precautions are taken. Substituting 'F-22' or 'G-141' for 'F-12' or G-12' can cause serious overloading of the compressor motor and cycling on the safety controls. The reverse substitution will result in serious reduction of capacity.

"Usually conversion from one refrigerant to another in a system is not warranted because of the cost involved. The effect of mixing refrigerants is similar. However, the seriousness of the effect depends upon the types of refrigerants involved and the proportions used.

"Last, but by no means least, is the servicing of hermetic compressors. It can be broken down into two distinct types of failures—mechanical, electrical.

"When a hermetic compressor is replaced because of mechanical failure, the service procedure is identical to that recommended for replacing an open-type compressor.

"However, if a motor burnout is involved, special treatment is essential. Products of combustion are released in the system and must be removed before a replacement is installed. Failure to do so will result in repeat failures. This is not just theory. Experience has proven this.

"Everybody is agreed that a good job of evacuation and dehydration is essential. It is the method rather than the need that is frequently questioned. In my opinion there are certain definite steps that should be taken to insure good results.

"1. Discard the original oil and refrigerant charge.

"2. Disassemble expansion valve and clean thoroughly.

"3. Flush entire system with liquid refrigerant until clean.

"4. Evacuate and dehydrate the system, preferably with a vacuum pump.

"5. Install an oversize dehydrator in the liquid line.

"6. Replace dehydrator after three or four weeks operation.

"7. Continue to check periodically and replace dehydrators until the oil in the system remains clear.

"This may sound like a difficult and expensive method, but there is no easy and cheap way of doing it satisfactorily."

What's the Market for Systems 100-Tons and Up?

Factors that Will Improve Are New, Existing Office Bldgs., Hotels, Hospitals, Apartment Houses, Laboratories, Department Stores, Shopping Centers, Industrial Air Conditioning

SYRACUSE, N. Y.—"Over the next 10 years, in the field of large air conditioning and refrigeration (100 tons and up), the industry will do a retail volume totalling about $10 billion," believes Charles V. Fenn, vice president, Machinery and Systems Div., Carrier Corp.

'56 Volume Expected To Be $600 Million

The volume this year will be about $600 million; in 1960, about $850 million; in 1965, $1.3 billion, declared Fenn at a recent press luncheon which marked the introduction of three new Carrier products for big systems:

A hermetic centrifugal compressor in the 100 to 325-ton range; a new automatic absorption machine (100 to 700 tons); and new "Conduit Weathermaster" units.

Analyzing the over-all dollar volume potential for big systems, Fenn said that today "about three-fourths of the total is accounted for by the following types of business: new office buildings, existing office buildings, hotels, hospitals, apartment houses, laboratories, department stores, shopping centers, and industrial air conditioning.

"Now let's take that three quarters and separate it from the rest of the business and take a look at the relative standings of these markets. It may surprise some of you to know that new office building air conditioning is not the largest single segment of the total. In fact, it stands in about third place, accounting for slightly less than one seventh of the over-all total. But it has played a far more important role than its relative position might indicate," Fenn declared.

"As I mentioned, virtually every major office building constructed since World War II has included complete air conditioning. And, as you know, there has been a tremendous building boom since the end of that war.

"Suppose you were the owner of an older office building in New York City. Immediately after World War II the rental market was tight and you had no problems in filling your building at rates which were economically satisfying to you. But suddenly a vast amount of modern, extremely desirable office space is created next door or in the same area.

Tenants Will Look for Air Conditioned Space

"You have prided yourself in providing 'Class A' space, but now your tenants find space available which is more modern because it is air conditioned. You are faced either with a prospective reduction in 'Class A' tenants or a modernization program.

"To give you a clearer picture of the situation, more than 60 brand new air conditioned office buildings have been erected in New York City since World War II," Fenn said.

"And here you are, the owner of an older building. What would you do? Well, the answer is obvious, and a good many of them have already.

Most New Business In '55 Was In Existing Bldgs.

"The largest single category of new business during the year 1955 was in existing office buildings. It accounted for more than one third of the total orders booked. In this particular market, it is interesting to break it down a little city by city, because certain principles have developed which seem to operate in each city.

"Let's look at a city like Dallas or Houston, for example. Here the saturation is literally 100%. There is no business in the air conditioning of existing office buildings. The office building market is solely in new construction and there is, of course, a great deal of this.

"But Dallas and Houston a decade ago presented a different story. As each new building went up—fully air conditioned—the old ones were forced to follow and soon they were all done," he commented.

When 18-20% of Class A Bldgs. Become Conditioned, All Others Must Follow

"It has become fairly well established that, when 18 to 20% of the 'Class A' office space has been air conditioned—and this point is reached mainly as a result of the construction of new air conditioned buildings—then all remaining buildings in the city must sooner or later air condition in order to maintain their status as 'Class A' space.

"We have seen the working of this principle in New York City in the past two or three years. Within this time, saturation reached the 18 to 20% mark. Today the market has broken wide open in the air conditioning of existing buildings. Saturation has already reached upwards of 22% and it is inevitable that every single building which expects to retain its top-flight position will install complete air conditioning," Fenn predicted.

"Let's look at a few other cities too so you can get a better over-all perspective. In Philadelphia, the saturation is now at about 18%. Surveys show Chicago at 17% and Cincinnati is just about reaching the point where many buildings will be forced to join the parade.

"As you can see, from a study of these cities in various geographical areas and climates, the air conditioning of every

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For more information about products advertised on this page use Information Center, page 66.

Potential Office Building Market Totals $3 Billion

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major office building in the nation is simply inevitable over a period of years. I would not attempt to hazard a guess as to the time involved for this to take place. It is likely to require a decade—or even longer.

"However, the pace will increase due to the operation of the saturation principle I have described. And this is nothing more than an expression of the competitive nature of the American business system as it applies to rental structures.

"I attended a Building Owners and Managers convention several years ago and one of the speakers, a prominent building manager, made the statement that the remark, 'Nothing is so sure as death and taxes,' was obsolete. The new and correct version is, 'Nothing is so sure as death, taxes, and the air conditioning of your office building.' Although this is a rather facetious remark, nevertheless this building manager was most truthful and very earnest in his statement and opinion," said Fenn.

"I think it might be interesting to take a look at the total business potential still available in this market. Today in this country there is something on the order of 600 to 700 million sq. ft. of 'Class A' office building space, including commercial, owner-occupied, Federal, state, and municipal.

"Applying an arbitrary cost per square foot for air conditioning and reducing this to some extent to account for the proportion of such buildings which may be allowed to become obsolete, the potential market still to come in the field of existing office buildings amounts to the staggering sum of $3 billion.

"Now let's look at a few of the other markets in our chosen field. I would like to mention apartment houses, which are candidates for our Modular Weathermaster units, as well as our centrifugals—both new and old—and our absorption machines.

Apartment Houses Have 1/8 Existing Dwelling Units

"You have heard a great deal lately about residential air conditioning. It might interest you to know that roughly one eighth of the existing dwelling units in the country are in apartment houses. Apartment house space, like office building space and perhaps even more so, was tight immediately after the war, but there has been a tremendous amount of house and apartment building construction in this past decade.

"Now the competitive system which forces one owner to do what the other one does, as explained relative to the air conditioning of existing office buildings, is beginning to operate in the field of apartment houses also," Fenn declared.

Seems Certain that All Apartment Bldgs. Must Become Conditioned

"The man who builds an apartment house today must look ahead and provide the modern features which will make his investment competitive for years to come. And this year we have seen the first faint stirrings of interest in the complete air conditioning of new apartment structures, although a number throughout the country are already done.

"It seems certain that, similar to the new office building field, the time will come very soon when all major new apartment buildings are air conditioned throughout. Incidentally, the FHA is much interested in the possibility of air conditioning many of the buildings on which they hold mortgages, so that they will remain fully rented and thus produce full income and need not be repossessed.

Over 50% of Hospitals Have Some Conditioning

"Let us take a look at hospitals. A hospital is a place for people who are suffering from the effects of illness, accident, or surgery. It is essential that the best possible care be given them, and this includes control of climate so that the patient will not have to fight the weather while attempting to recover.

"Early in he history of air conditioning, installations for special treatement areas, such as operating rooms, delivery rooms, recovery rooms, and X-ray rooms, began. Today well over half the hospitals in the country have air conditioning in some form in some area. However, not until 1949 did the air conditioning of a large number of patients' rooms get under way. Today, as far as Carrier is concerned, hospitals are in fifth place in total air conditioning orders booked," Fenn revealed.

"And now the hotel market. Until the last few years there has been virtually no major hotel construction since the beginning of the depression. But just recently a number of new hotels have been built—all air conditioned—a substantial percentage of them by the Hilton chain. I might mention a few of these: the Los Angeles Statler, the Beverly-Hilton, the Dallas-Statler, the Hartford-Statler, the new Sheraton going up in Philadelphia.

Many Existing Hotels Gradually Added Units

"In addition, a number of existing hotels have gradually added air conditioning. Chicago is a prominent example, as is Dallas, Atlanta, Pittsburgh,

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Industrial Plant Probably Most Exciting Market Now

(Continued from preceding page)

Houston, and Philadelphia. But take a look at New York City.

"How many times have you stood in a line at a reception desk and heard people ask for an air conditioned room and heard the answer, 'I'm sorry, all of our air conditioned rooms are taken,' or, 'I'm sorry, we don't have air conditioning.' Well, I have a feeling that this situation is going to change," Fenn said.

"I venture without any fear to predict that the majority of the important hotels in New York City will be completely air conditioned within the next decade and perhaps sooner.

"In this country there are more than 600 hotels with 300 rooms or more, exclusive of resort hotels, and goodness knows how many there are with less than 300 rooms. I suspect the available business in this market is almost $\$1/2$ billion.

"As you will recognize, the great volume of home construction over the past decade has been largely in the suburbs of the cities. And with it has come a new type of merchandising combination—the shopping center.

Suburban Shopping Centers Nearly All Conditioned

"One of the advantages of the suburban shopping center is, of course, the fact that it is easier for the new suburban dwellers to reach by automobile. Another is that the buildings are new and thoroughly modern and almost all of them are completely air conditioned," Fenn pointed out.

"The result has been an increase of more than twofold in Carrier new business during 1955 in the field of department stores and shopping centers. And today such installations represent the second largest category of business in our large air conditioning. And I suspect this holds true for the industry," he added.

"We have talked about the office buildings, hotels, hospitals, apartments houses, and shopping centers. But let's get clear away from this type of air conditioning and explore what is probably the most exciting market of all—the industrial plant.

25-50 Times As Much Space In Factories as Offices

"What would you say is the over-all proportion between factory space in this country and office space? What would you guess? I don't think anybody can provide an accurate figure, but it is something on the order of 25 to 50 sq. ft. of factory space to every single sq. ft. of office space," Fenn suggested.

"But that's not all the story. Manufacturing plants inherently house heat-making equipment, primarily motors used for driving the mechanical facilities and, of course, in many plants because of welding processes, open flames, resistance heating, or something else where great quantities of heat are liberated.

"To show you what I mean, let me cite these figures. In a textile plant, in the spinning or twisting area, the heat load to be absorbed by air conditioning is roughly $5\frac{1}{4}$ times per square foot what it is in a typical office building. In a weave room, where the yarn is made into cloth, the load is approximately $2\frac{1}{4}$ times as much.

"In other areas of the textile plant, the machinery and lights make the load approximately 3 to $3\frac{1}{2}$ times as much as would exist in an office building, and it is my very best guess that all

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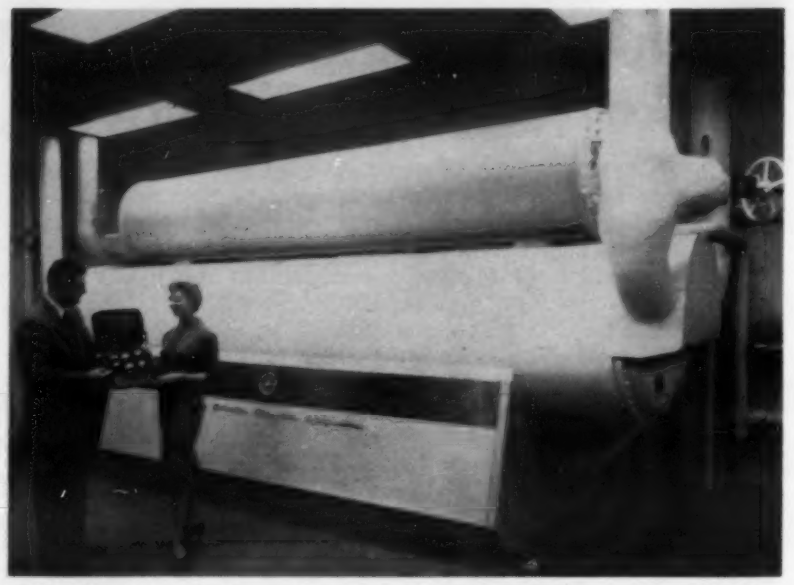

BIG SYSTEMS do not have to be exceptionally complicated as is proved by the large capacity (100 to 700 tons) "pushbutton" Carrier absorption refrigerating machine. All spare parts required, including pump seals, valve diaphragms, ball check valve, small sight glass, and gaskets, fit into the briefcase held by the product specialist. The unit can be started or stopped by pushbutton thermostat or time clock, and adjusts itself by electronic controls to variations in cooling requirements.

Competitive System Demands Factories Add Conditioning

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industrial plants might average out so that the load is somewhere between 2 and 2½ times as much per square foot of area.

"A few years ago we air conditioned a textile mill which was referred to as an 18,000-spindle mill. The mill was completely integrated from spinning and twisting, right down through weaving, inspection and shipping. This mill required 1,200 tons of refrigeration.

"Currently there exists in the United States approximately 18,000,000 total spindles in the industry. From this you can rapidly calculate that if 100% of the industry added refrigeration to their plants, 1,200,000 tons would be required.

"I have very reliable figures available which indicate that only approximately 100,000 tons of refrigeration have been installed in this industry to date, which means that the market is perhaps 8% to 10% saturated. And the textile market, gentlemen, is one of the most air conditioned of all, since this industry has almost always had some degree of air conditioning and has been actively adding refrigeration since 1945.

"Now I would certainly not attempt to tell you that every single factory in the country will eventually be air conditioned. There are factories, which are perhaps 100 years old which can never be made completely modern. Gradually portions of this obsolescent space are torn down or converted into warehouse facilities.

"But we are living in a modern competitive system and the factors of competition operate in a factory just as they do in the office building, the apartment house, the hotel, and the shopping center. It is inevitable that in time a very large percentage of the modern production facilities in this country will incorporate complete or partial air conditioning. And that makes this the largest potential with which we have to deal.

"That was ten years ago and many textile plants have added air conditioning, including refrigeration, in that period of time.

"And now to bring you completely up to date, here is a story about Sylvania Electric Products, Inc. and their plant in Huntington, W. Va. An air conditioning job involving an exceedingly large expenditure was placed in operation in the midsummer of 1955.

"We have received a report which says that although it is too early to obtain measured results from this installation, it was learned from the plant manager that their rate of turnover was 1.2% in August, which is the lowest in the history of the plant. I understand that it has run as high as 3 and 4% at the worst and is usually at least 2% during any summer month.

Air Conditioning Reduced Employe Turnover 40%

"This means the turnover was reduced by a minimum of 40%. It's reasonable to say that it costs them about $1,000 to hire and train a new employe, and it is therefore obvious that they are already getting a fine return on this single point.

"It was also reported that they had remarkably low absenteeism in August and that practically every worker physically able to get to the plant was on hand during the month. This compares to past experience when during hot weather high absenteeism has been encountered and any number of excuses relative to the absence given.

"Just for the sake of adding another nationally known name, let's talk about the Elgin National Watch Co. They found out that after they added air conditioning their rework decreased 25% and employe efficiency increased a similar amount," Fenn revealed.

Air Conditioning Costs Low at Units per Hour

"The actual cost of air conditioning turns out, generally, to be relatively low when reduced to the cost per piece produced, or the cost per hour, or the cost per person. And now let me illustrate this.

"Most hosiery plants are air conditioned and have been for years, with a very substantial number being done after World War II. Actual figures in this industry show that the owning and operating costs of a hosiery plant were related to one pair of the finished product, amount to ⅛ of one cent per pair, or three mills per pair. This assumes production on a two-shift basis and a reasonable amount of down time.

"Also an analysis of at least one job showed, due to less maintenance on machines, less down time, etc., savings per year of up to 80% of the total investment required to install air conditioning in the first place. These figures are, of course, fantastic, but is it any wonder that with figures like this available, almost all hosiery plants are today air conditioned.

Office Bldg. Cost per Employe Figures

"Figures are also available on the cost of air conditioning per employe in an office building and the increase in efficiency that is necessary in order to pay off the cost. The average annual owning and operating cost of air conditioning in an office building is $60 to $70 per employe. Assuming an average salary level of approximately $4,500, the increase in employe efficiency to offset this cost is only 1.3% to 1.6%.

"The figures are difficult to believe, but nevertheless can be completely substantiated. Many people are hard to convince that such an analysis is correct, but can there be any doubt that year-round efficiency of people will be increased substantially more than the percentage given, by the addition of good year-round air conditioning?

"It should be completely self-evident that in these highly competitive days, and I am sure they will get more competitive before they get less competitive, it is absolutely inevitable that the modern industrial plant with the ever-increasing problem of producing goods at lower costs than its competitors, will be air conditioned. And not only will this air conditioning be in the plants, it will be in the offices which serve the plant and in the office buildings that service the product through sales, with all of its ramifications, in all of our big cities," Fenn predicted.

For more information about products advertised on this page use Information Center, page 66.

Tru-Air Describes Large Air-Cooled Condensers

——KEY NO. R-320——

PASSAIC, N. J.—Tru-Air Corp. here recently published a bulletin on its new line of heavy-duty air-cooled condensers.

Bulletin AC-3 describes units which range in capacity up to 200 tons using "Freon-12" and "Freon-22" refrigerant.

D-H Manual Is for Architects, Engineers

——KEY NO. R-321——

LOS ANGELES—A new and modernized 40-page engineering manual, No. E.M.-G.5622, has been published especially as a reference guide for architects, engineers, and air conditioning contractors by Drayer-Hanson, Inc. here.

It contains the latest and most complete data on the company's line of large air handling units—the "HH" (ceiling-suspended) and "HHV" (floor-mounted) series for commercial, industrial, and residential heating and cooling.

The comprehensive manual illustrates and gives dimensions and capacities with a great amount of selection and application data. Helpful charts and tables of general interest cover several pages.

Included is a psychometric chart with "how-to-use" visual instructions, a graph detailing total heat of moist air, a table covering mean temperature difference, etc.

Store Modernization Group Offers Guide

——KEY NO. R-322——

DARIEN, Conn. — A "Basic Guide on Store Modernization" was recently made available by Store Modernization Institute here.

For store owners who want advice on where to begin and how to go about modernizing their stores, the Guide was prepared by architect and engineer consultants.

Purpose of the publication is to show small store owners how to gather facts, organize ideas, and avoid costly mistakes.

Frozen Food Handling Is Govt. Report Topic

——KEY NO. R-323——

WASHINGTON, D. C. — "Some Improved Methods of Handling Frozen Food in Wholesale Plants," a report on research undertaken to develop improved methods and equipment necessary to make frozen food distribution operations more efficient, was issued here recently by the Superintendent of Documents, U. S. Government Printing Office, it was recently announced.

Acme Catalog Covers Remote Room Conditioners

——KEY NO. R-324——

JACKSON, Mich.—A new eight-page catalog (No. 210-B) detailing the new line of "Flow-Temp" remote room conditioners has been released by Acme Industries, Inc. here.

Models for ceiling, wall, or free-standing installations are presented in three available basic capacities of 200, 400, and 600 c.f.m. Individual room control, quiet operation, and true conditioning of the air are features, the company said. Heating and cooling, dehumidification, fresh air ventilation, filtering, and circulation are all accomplished by a single compact unit, Acme added.

The new catalog includes an easy-to-use selection procedure, general specifications, dimensions, and all necessary capacity tables.

Low Temp Silver Brazing Is Subject of Guide

——KEY NO. R-325——

NEWARK, N. J.—"A Complete Guide to Selective Fluxing for Low Temperature Silver Brazing" to aid in selecting fluxes based on specific temperature ranges and metals to be joined was published here recently by American Platinum Works, it was announced.

The manual outlines applications and characteristics of APW fluxes, contains a complete "Flux Selector Chart," and the first released data on "Deoxo" general purpose flux, and APW "Black Flux."

Intermatic Brochure Covers Time Controls

——KEY NO. R-326——

CHICAGO — Publication of a new brochure for heating contractors and engineers was announced recently by International Register Co., maker of Intermatic time switches.

The 4-page folder describes use of automatic time controls with oil burners, gas units, and stokers with a section devoted to wiring diagrams and control of thermostats, the company said.

Standard timer applications are listed together with the type of time control needed, and a short description of switch action upon temperature control is given for each application, the firm further stated.

Worthington Bulletin Covers Flexi-Cool Unit

——KEY NO. R-327——

HARRISON, N. J.—A new bulletin on its "Flexi-Cool" unit has been issued by Worthington Corp. here.

"The new Flexi-Cool unit offers the advantages of packaged air conditioning and custom tailored central system," the company noted. "It can be used for almost any residential or commercial installation. Its factory packaged matching sections can be assembled in a wide variety of sizes and arrangements to meet any air conditioning problem."

The bulletin (#C-1100S105-P) illustrates many of the ways in which Flexi-Cool can be arranged. It shows the relative positions of the basic components — cooling cycle, blower, filter, and plenum sections—and also gives piping and duct sizes.

L.O.F. Catalog Explains Products, Applications

——KEY NO. R-328——

TOLEDO—A new catalog with a condensed explanation of its many products and their applications has just come off the press for L.O.F. Glass Fibers Co., it was further announced.

The catalog, Form WPD-11, describes and illustrates uses of the company's "Microlite" and "Super Fine" blanket insulations for thermal and acoustical treatments. In addition, it refers to "Microflex" compressed board, a resilient cushion material and quartz and glass "Micro-Fibers."

General Controls Offers Heating Catalog

——KEY NO. R-329——

GLENDALE, Calif. — General Controls Co. has announced publication of a new automatic heating controls catalog.

Many new items, including a complete line of oil, coal, and electric heating controls, plus the latest improvements and changes in the General Controls line of gas heating controls, have been cataloged for the first time, the company said.

Infra Insulation Gives Installation Instruction

——KEY NO. R-3210——

NEW YORK CITY — Instructions on installation of insulation between steel studs and under other conditions are included in a pamphlet recently released by Infra Insulation Inc., it was announced.

"Heat Flow by Radiation in Buildings, Simplified Physics" discusses principles of heat flow and practical application in layman's language, according to the company.

IAC Brochure Describes 'Q-Duct' Silencing System

KEY NO. R-3211

NEW YORK CITY—A brochure describing the new "Q-Duct" Silencing system for air conditioning and ventilation installations is now available from Industrial Acoustics Co., Inc., here.

The catalog describes in detail the various applications of the new, prefabricated "Q-Duct" units which are available in over 148 sizes to fit any installation.

3-Color Catalog Covers Full Bronze Valve Line

KEY NO. R-3212

ELKHART, Ind.— Paul Nankivell, director of sales for Northern Indiana Brass Co., has announced the publication of a new three-color catalog covering the firm's complete line of bronze valves.

This 28-page catalog, NVC-2, lists more than 250 different sizes and styles of low pressure, pressure rated, and flared tube valves, including Nibco's new line of solder and threaded end check valves.

Complete information on weights, dimensions, and shipping quantities is furnished.

Warren Illustrates Commercial Line

KEY NO. R-3213

ATLANTA — A brochure illustrating its entire line of commercial refrigeration units was recently issued by Warren Co., Inc.

Merchandisers, walk-ins, dairy cases, beverage coolers, frozen food cases, freezers, closed meat cases, open meat cases, produce cases, and multi-case units are all pictured and described in the folder.

Keystone Catalogs 'Copperflow' Line

KEY NO. R-3214

ERIE, Pa.—A 28-page catalog 56-N covering the complete "Copperflow" line of fittings and valves for copper tube plumbing, heating, air conditioning and refrigeration has just been issued by Keystone Brass Works here.

Illustrations, specifications, and engineering data are included for the company's full line of wrot copper, cast solder, flared tube and solder drainage fittings, valves, and balancing valves.

Booklet Explains Retail Advertising

KEY NO. R-3215

URBANA, Ill.—A 55-page booklet on objectives, planning, and operation of retail advertising, called "Newspaper Advertising for the Small Retailer," was published here recently by Business Management Service, College of Commerce and Business Administration, University of Illinois.

G-E Bulletin Details Motor Control Center

KEY NO. R-3216

PLAINVILLE, Conn. — General Electric Co., Distribution Assemblies Dept., recently issued a new bulletin, GEA-6367, detailing construction and application of a new general-purpose motor control center.

Type DA7093 control center is described in the 24-page(two-color publication together with lists of ratings, weights, dimensions, installation data, and guide form specifications.

Niagara Catalogs Snip, Shear Line

KEY NO. R-3217

BUFFALO—Niagara Machine & Tool Works recently issued a bulletin (78) which covers nine new sheet metalworker's snips and shears, the company announced.

Also described and illustrated are Niagara bench shears, hammers, mallets, stakes, bench plates, rivet seats, groovers, hollow punches, bending machine, roofing folder, pipe crimper, roofing double seamer, and gutter beader, it was pointed out.

Illustrated Bulletin Shows Ventura Fan Line

KEY NO. R-3218

DETROIT—A new two-color, four-page catalog (Bulletin No. 6414) describing the new model G Ventura fans for business and commercial exhaust applications is now available from American Blower Corp. here.

The illustrated catalog lists such performance data as c.f.m. at various static pressures, fan r.p.m., motor hp., quietness rating, and maximum net weight for each of the 25 different direct-drive units in the new model G line.

Recommended time for complete air changes for various establishments are given.

'Engineering Audits' Described In Folder

KEY NO. R-3219

CLEVELAND—A new service termed "Engineering Audits" is described in a 4-page folder recently made available here by Designers for Industry, Inc., the firm announced.

Aimed to "improve product quality, cut production costs, increase sales appeal, reduce inventory requirements, eliminate production headaches, and forecast trend," this folder is useful in air conditioning, heating, and ventilating fields, the company claims.

Aluminum Brazing Presented In Book

KEY NO. R-3220

PITTSBURGH — Practical shop data and up-to-date developments in the art of brazing aluminum are presented in a new book, "Brazing Alcoa Aluminum," published by Aluminum Co. of America, it was announced.

Descriptions of Alcoa brazing materials, and the considerations involved in designing, preparing, and assembling brazed joints are treated in full, according to the company.

Succeeding chapters in the 134-page, illustrated book deal with specialized processes; brazing castings; brazing aluminum to other metals; performance of brazed joints; cleaning and finishing; and inspecting and testing, it was announced.

T. R. Finn Describes Vibration Mountings

KEY NO. R-3221

HAWTHORNE, N. J.—The complete line of T. R. Finn & Co., Inc., "Rubber-In Shear" vibration mountings is described in a catalog recently released by the manufacturer.

Various types of vibration mountings with load capacities ranging from 40 to 10,000 lbs. are detailed, as are the non-walking base plates that eliminate creep or walking and need for lagging, the company said.

Simpson Catalogs Test Equipment Line

KEY NO. R-32122

CHICAGO — Simpson Electric Co. here announces the availability of a new catalog bulletin describing its test equipment for servicing refrigeration, air conditioning, and heating equipment and appliances.

The detailed, multi-page bulletin, No. 3001, is designed especially for the air conditioning and refrigeration wholesaler and the service technician trade.

Meat Packing Insulation Case Studies Illustrated

KEY NO. R-3223

PITTSBURGH—A set of five insulation case studies, illustrating how actual insulation problems in the meat packing industry were solved, is available from Pittsburgh Corning Corp. here.

The reports, bound in a spiral binder, utilize text, photographs, and detail drawings to explain the installation procedures, insulation thicknesses used, and results.

2, 3, 5-Ton Air-Cooled Conditioner Line Adapts Warm Air Systems to Cooling

COLUMBUS, Ohio — Air-cooled cooling conditioners in 2, 3, and 5-ton capacity SRA models will be available in the Janitrol line of cooling conditioners for 1956, it was announced recently by H. C. Gurney, sales manager, Janitrol Heating & Air Conditioning Div. of Surface Combustion Corp.

Any existing forced warm air heating system may be adapted for cooling with the new SRA air-cooled units, the manufacturer states. They may be teamed with vertical up-flow, counter-flow, or horizontal furnaces of standard make, gas or oil-fired, and are especially suited for use with Janitrol winter conditioners.

An accessory blower package is optional and can be furnished for applications requiring more blower capacity than the existing warm air system will provide, and for installation of the new Janitrol air-cooled conditioner with wet heat systems or in areas without central heating.

SHOWN here is the new Janitrol "Pride o' Yard" remote compressor-condenser unit used with Janitrol air-cooled summer conditioners. It features "top-exhaust" for higher cooling and protection of nearby plant life. Grille work encloses all moving parts.

The evaporator coil is housed in a compact, all-steel cabinet and is adaptable for either vertical or horizontal air flow. This, says the manufacturer, increases flexibility of installation and the sales potential of this unit.

The coil mounts easily in the outlet air duct, either above or below the furnace as required, it was stated. The unit features aluminum cooling fins firmly expanded on copper tubing.

The compressor-condenser with "top-exhaust," claimed as an exclusive feature by Janitrol, cannot cause "drying out" of shrubs and flowers planted close by, and utilizes the cooler ground air for cooling, the announcement said. It features a condenser "especially designed for use with air-cooling."

New "low-louver" styling is said to harmonize with any architectural motif. All metal parts are finished in blue-gray with bright chrome trim.

The compressor-condenser section is constructed so that all normal field servicing can be performed on location, according to the company.

It is warranted for five years against defective materials and workmanship, the company added.

Janitrol said field tests in areas of severe heat and humidity prove the SRA air-cooled conditioner "delivers cool refreshing air with outside temperatures to 125° F."

The performance factor achieved under ASRE conditions (8.6 B.t.u. per watt, including condenser fan operation) assures highly economical operation, the manufacturer announced.

Minneapolis-Honeywell Names 2 Branch Mgrs.

MINNEAPOLIS — Appointments of new managers of Minneapolis-Honeywell Regulator Co. offices in Des Moines and Fort Wayne were announced by Gavin S. Younkin, the company's general sales manager.

John Bain, a sales engineer in the Des Moines branch office, has been promoted to branch manager to replace N. L. Rutgers who resigned a short time ago.

Gordon Klossner has been transferred from Chicago to manage the company's Fort Wayne district office, replacing George Steffins who was earlier named manager of Honeywell's Memphis office. Klossner was formerly in charge of Minneapolis-Honeywell's service and installation section located in Chicago.

In other recent promotions, Frank Neal, formerly a market development salesman in the company's Los Angeles office, has been named western market sales manager for schools; Dick Beaubien, senior commercial salesman in San Francisco, has been promoted to branch commercial sales manager there; and Bob Hoefer, formerly senior commercial salesman in Akron, has been named branch commercial sales manager in Minneapolis-Honeywell's Cincinnati office, it was reported.

American-Standard Outlines Merchandising Plan To Meet Year-Round Home Air Conditioning Trend

ELYRIA, Ohio—At a national sales meeting held recently at its plant here, the Air Conditioning Div. of American-Standard outlined a "new approach" to the merchandising of year-round residential air conditioning.

New products were introduced, and the group also viewed a presentation of new cooling sales promotion literature and consumer advertising which the division has developed to meet 1956 selling conditions.

"The new approach," states W. H. Baker, Jr., vice president, sales, "is designed to take advantage of the fact that central cooling, with one unit that air conditions the entire house, has really begun to click with the public.

"There's every indication that 1956 will be the biggest sales year our distributors and dealers in this field have ever had. To capitalize on this trend, we are going to make the public realize how easy and inexpensive it is to add summer air conditioning to existing home heating systems.

"Inquiries, received from interested homeowners will give our dealers 'a foot in the door' for a warm air furnace replacement as well as the sale of a summer unit. We also expect that the new American-Standard year-round models will appeal to the homeowner as a natural for replacing and old, inefficient furnace."

New products presented at the meeting reflected the increasing popularity of air-cooled air conditioners which require no water for operation, it was stated.

"Though originally designed to meet the demands of communities where water use is restricted, units of this type are also selling in big volume in localities where water is plentiful," says Frank P. Weil, vice president in charge of manufacturing.

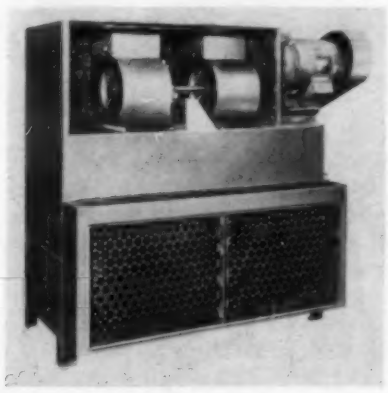
"Our air-cooled line now includes evaporator units that make it possible to connect the outdoor, air-cooled condensing unit to any type of forced warm air system regardless of whether the furnace is a basement model, utility, counter-flow, or horizontal.

"For homes presently heated by steam or hot water, air-cooled summer cooling can now be added by the use of a complete air conditioning package which contains its own blower for air distribution."

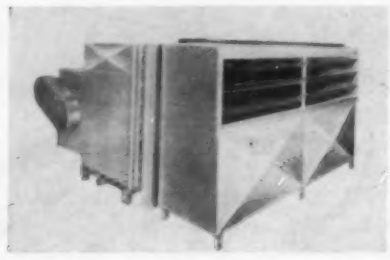
According to T. W. McNeill, president, "The Air Conditioning Div. will promote this complete line with an extensive national campaign in major home magazines, plus many local campaigns which will be conducted by our distributors throughout the country.

"Supplementing these over-all efforts there will be a full range of sales literature, newspaper ad mats, commercials for radio, filmed TV spots, and dealer identification material."

For more information about products advertised on this page use Information Center, page 66.



SHOWN above is Worthington model CV cabinet air conditioner.



DESIGNED for use in stores, shops, apartment buildings, hotels, large factories, etc., horizontal model CH Worthington cabinet unit is companion to model CV pictured at left.

Interchangeable Panels Permit Any Air Intake, Discharge In Worthington Cabinet Conditioner

HARRISON, N. J.—A new line of cabinet type air conditioning units that cool, dehumidify, heat, humidify, and clean the air has been developed by Worthington Corp.

Exclusive feature of this new line is its "flexibility and compact arrangement which solves most space problems as interchangeable panels permit any preferred air discharge and air intake," the company said. "The motor mounting and fan location may be positioned in front, top, or back, of unit.

"Another exclusive feature is the 3½-in. variation in motor base adjustment made possible by a single screw. A locking nut holds the base in the proper position. This feature enables exact positioning of the motor for correct belt tension at all times.

Designed for use in stores, shops, apartment buildings, hotels, large factories, etc., the units can be installed either vertically (model CV) or horizontally (model CH).

The units consist of three basic sections—base section, fan section, and coil section with a drip pan. They will be available in 10 different sizes, ranging from 1½ to 106 tons capacity, and will offer as many as 81 coil combinations for either chilled water or direct expansion application.

The units will handle up to 19,200 c.f.m., according to Worthington. The five smaller sizes will be shipped assembled; the five larger sizes will be shipped in sections according to customer specifications, it was added.

Other important features are lubricated-for-life fan shaft ball bearings; choice of high or low velocity filters; and rigid cross-break panels. Accessories include cleanable water coils, steam pan humidifiers.

All accessories are interchangeable between horizontal and vertical units, the company said.

Surface Combustion Ups Bluethe In Advertising For Industrial Div.

TOLEDO—Hans W. Bluethe recently was promoted to advertising manager, Industrial Div., Surface Combustion Corp. here, it was announced. He will be responsible for promotion of Kathabar dehumidification systems, heat treating furnaces, and steel mill and glass processing equipment.

Bluethe joined the firm's industrial advertising department last May. Prior to that he had been promoting industrial heating and control equipment with Lindberg Engineering Co., Wheelco Instruments Co., and an advertising agency in Chicago, it was reported.

Slipher To Advise Frigidaire on Home Building Products

DAYTON — David C. Slipher, pioneer in the industrialization of home building, has been retained by Frigidaire Div. of General Motors Corp. as a consultant on research, design, and marketing of appliance and air conditioning products for the home building industry.

D. C. Slipher

H. F. Lehman, Frigidaire's general sales manager, said the appointment was further evidence of the emphasis his firm is placing on the development of products especially suited to that market.

Slipher is a member of the board of trustees of the National Association of Home Builders' Research Institute, and until recently was the group's chairman.

He is a consultant to the American Council to Improve our Neighborhoods (ACTION), it was reported.

Associated now with the Fritz B. Burns organization, Los Angeles, he began his business career with Roston Corp., Lafayette, Ind., in 1933, and in 1935 joined Houses Inc., New York City, as chief engineer, it was stated.

American Blower Names 2 Distributors of Air Conditioning Units

DETROIT — E. W. Petersen, vice president, sales, for American Blower Corp., announces the appointments of McCombs Supply Co., Denver, and Marbut Co., Macon, Ga., as distributors of the company's line of self-contained air conditioning units ranging 3 to 20-ton capacities.

McCombs Supply has started a campaign to secure additional dealers in Colorado, central southeastern Wyoming, southwestern South Dakota, western Nebraska, and the extreme western part of Kansas.

Marbut is seeking dealers in central and southern Georgia and north central Florida.

Lau Appoints Wolford District Sales Mgr.

DAYTON—E. C. Wolford of Cranford, N. J. has been named eastern district sales manager for the Blower Div., Lau Blower Co., according to William W. Morrisey, division sales manager.

E. C. Wolford

A graduate of the University of Cincinnati and holder of a Masters Degree in mechanical engineering, Wolford is a veteran in the Lau organization, having been associated with the firm for 19 years. He was formerly a salesman for National Cash Register Co.

Chilled Water Central Air Conditioning Installed for $1,000-1,400 Utilizes Wet Heating System, Needs No Ducts

NEW YORK CITY—Research sponsored by the Institute of Boiler and Radiator Manufacturers at the University of Illinois is said to have demonstrated that a new method of central summer cooling can be economical and highly practical for homes heated by hot water or steam.

System Applicable to All Homes Using Wet Heat

The method utilizes a cooling system split from the hot water heating system and operating on the so-called "liquid" or chilled water principle of cooling. It is applicable to virtually all of the estimated 10,000,000 new and old homes in the U. S. heated by hot water or steam systems, the Institute says.

A research report by Warren S. Harris, research professor who directed the study, emphasized that this cooling system is particularly suited to homes with existing hot water or steam systems since it does not interfere with or detract from heating quality. It also avoids the need for sheet metal ductwork.

The report is a result of a continuing residential heating-cooling research program conducted by I-B-R in cooperation with the University. Studies are conducted in a six-room test house in Urbana, Ill., under the direction and supervision of University staff members.

According to Prof. Harris, the system used in the research home during recent tests "produced satisfactory room air temperature and humidity control, and did so with no compromise as far as winter heating performance was concerned. Operating costs," he said, "were comparable to those of other successful systems."

Water Chiller Placed Out-of-Way

In the new cooling system, a circuit of small piping is used to hook up a water chiller to a heavy duty forced convector, consisting of fan, coils, and filter. The water chiller is placed in the basement, utility closet, outdoors, or any other out-of-the-way location.

The convector, the report stated, is usually placed in a central position in the house hidden in a "plenum" or distributing chamber which may be formed by dropping a center hall ceiling or center room ceiling by about one foot. Cooled currents of air are released from the plenum through high wall registers into surrounding rooms.

Average Operating Cost About 95c a Day

A cost study showed that at an average outdoor temperature of 84° F. (maximum outdoor temperature about 94° F.), the cost of operation was about 95 cents a day. Lower average temperatures would result in lower daily operating costs.

As for installation, the system can be put into the average house for between $1,000 and $1,400, it is said.

Another significant development to come out of the research work was the establishment of the most practical method for designing such a system. Tests indicated the proper size of cooling equipment which should be selected for the most efficient cooling results. This is important, the report says, since research has shown that oversizing residential cooling equipment reduces the ability of the system to dehumidify the air.

According to I-B-R, the advantages of this new system go beyond its economical application to old or new homes with hot water or steam heating systems. It preserves the features which may already be in or can be added to the existing hot water system, such as built-in domestic water heater for tap water, a snow melting system, and radiant heating.

Development of this system brings to four the total number of ways central summer cooling can be employed in homes heated by hot water systems.

One of these other central cooling systems utilizes an "air" instead of chilled water unit in combination with either a dropped ceiling plenum or short ductwork. Highly adaptable, its central "air" unit distributes cooling in much the same fashion as the chilled water unit —that is, through high wall or ceiling registers.

There are two other systems now on the market which are especially designed for owners

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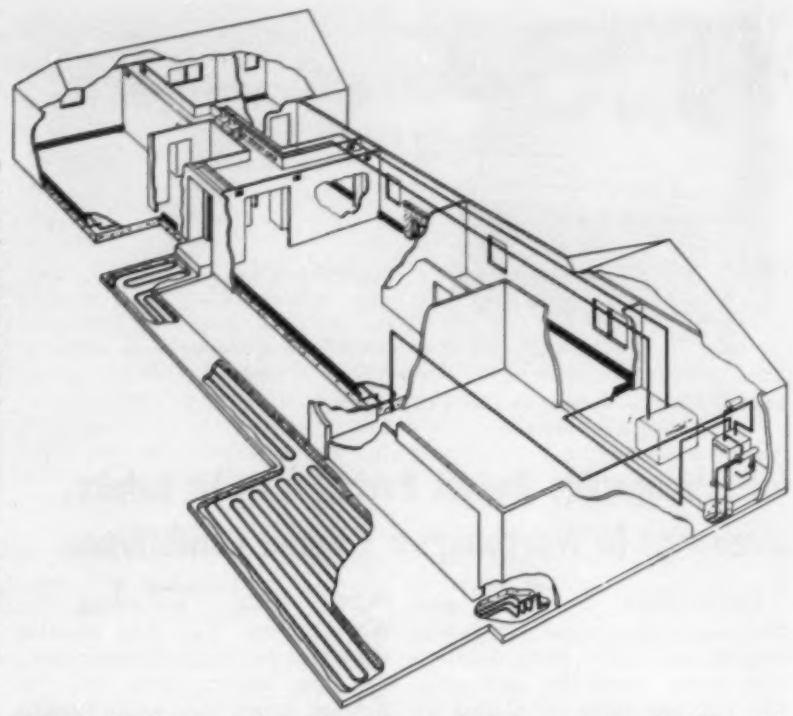


CENTRAL chilled water cooling system shown in diagram is same type as that tested at University of Illinois. In this house, boiler and water chiller are located in utility room (foreground right). Thin piping hooks up water chiller to heavy duty forced convectors, which are placed in dropped center hall ceiling plenum (background center). Plenum forms a distributing chamber in central location, dispensing cool air into surrounding rooms through high wall registers. Heating is by forced hot water baseboard system. Baseboards are located around perimeter of house at base of walls. Sinuous pipe seen in immediate foreground is a snow melting system, embedded in driveway and walk, and connected to house heating boiler. Boiler also supplies all household hot water.

For more information about products advertised on this page use Information Center, page 66.

Chilled Water--

(Concluded from preceding page)

of new homes who wish to have summer cooling combined with hot water heating. First is a year-round baseboard system circulating hot water for heating and chilled water for cooling. In addition to cooling, the dual system also filters, circulates, and dehumidifies the air, all through the same conventional looking baseboard "radiator" that heats the home.

The second type of year-round heating-cooling system for new homes employs forced convectors as distributing units, usually placed one to a room. Ordinarily recessed in the walls under windows, these units contain a variable speed fan, coils, filter and switch for individual operation. All units are hooked up to the same hot-cold piping circuit. This system, too, can include a domestic water heater built into the boiler, and snow melting system working off the same boiler.

Advertising Stunts Up Firm's Home, Commercial Air Conditioning Sales

PHOENIX, Ariz.—Humor, advanced to the point of sheer whimsey, has proven far more effective than "price" or "bragging" statements in landing both commercial and residential air conditioning contracts for True Air Conditioning Co. here.

Officers of the firm, E. C. "Pat" Johnson, president; Russell Bergstrom, vice president; and L. E. Ulinger, secretary-treasurer, are uniformly convinced that if direct mail advertising "looks like direct mail advertising," it is far more likely to find an immediate home in the waste basket than on the prospect's desk.

Consequently, True Air Conditioning Co., which developed its unusual name to distinguish mechanically-refrigerated air conditioning from the evaporative cooler variety three years ago, has subtly introduced its direct mail appeal via highly circuitous routes.

Typical examples are the direct mail sheets which have been sent out on the average of once per month to a long list of "logical prospects" for either refrigeration, commercial, or residential air conditioning. Contrary to the usual direct mail policy, each goes out in a plain white envelope with no identifying marks whatsoever and at first glance the contents resemble either a cartoon, a personal letter, or a portrait.

All of them have been personally produced by Pat Johnson, a veteran refrigeration contractor who takes plenty of time off to devote to the advertising program.

Each mailing piece is replete with "gimmicks." Typically, as shown in the accompanying illustration, one sheet shows a drawing in the upper right hand corner of either a young girl or an old woman depending upon the way that the optical illusion appears to the reader's eye.

Copy asks "What Do You See?—The Young Girl Or The Old Woman?—Can You See Both?" The cartoon figure, which Johnson found in an art magazine, shows a young girl looking away or an old lady looking toward the viewer, and it isn't difficult to find both.

"Almost everybody has been intrigued by the illusion enough to make at least an effort to see one face or the other," Johnson said, "as their comments have proved." True uses this stunt to point out to the air conditioning prospect that there are several ways of looking at air conditioning.

Another direct mail piece sent out with the headline "So An Egg is An Egg?". At the top painting of a mother hen looking askance at an ugly duckling among her chicks.

Here, Johnson struck a responsive note by pointing out that "You Can't Get Stuck With An 'Ugly Duckling' Purchase When You Buy Air Conditioning By True."

An extra in the direct mail sequence and one which has been used continuously ever since was the printing of the figure $100, in the lower left-hand corner of the sheet. There is no reference in the copy to the $100 and it proved highly puzzling to all readers.

The $100 "gimmick" was given more emphasis with larger figures in the following direct mail piece because of the steady stream of letters which the first mailing brought.

The unusual direct mail system was a hit from the beginning, as a thick folder of letters in Pat Johnson's office indicate. In almost every instance the contractors, builders, painters, architects, and homeowners who received samples of the direct mail led them to commend the cleverness of the program. Just as invariably each asked what the $100 mentioned in the series referred to.

"We were amused at the various reactions," Johnson said, "a few contractors assumed that the $100 was a potential rebate on the cost of air conditioning their homes, while others got the idea that the $100 was a prize for some sort of contest. In any event we got some sort of interested response from 95% of the people to whom the series was mailed, and we feel reasonably sure that the name of True Air Conditioning Co. will come whenever cooling is the subject."

OPTICAL illusion advertising aids firm's air conditioning sales.

ANOTHER bit of direct mail advertising that attracts reader, increases sales.

Refrigeration Problems And Their Solution

By Paul Reed

For Service and Installation Engineers

Spring Service on Room Conditioners

In some parts of the country, users will soon be starting up their air conditioners, and then service departments who have been having trouble finding enough to do all winter will be deluged with service calls. Many of these service calls will be on window units or console types of room air conditioners.

'MY ROOM COOLER WON'T RUN'

Many such calls will be that the unit won't start. "It was all OK last fall. The last time I used it, I just turned it off and now it won't start."

Most of these will turn out to be due to:

1. Attachment cord plug pulled from wall receptacle; no telling when, maybe to connect the Christmas tree lights.
2. Branch line switch in the basement pulled, or fuses taken out. In some cases, the fuses will not be found; probably "borrowed" to replace blown fuses in another circuit.

If you replace fuses or find the switch open, check the unit before starting. It may have have been pumped down last fall, and the valves (if any) may be closed.

3. There will be the usual crop of calls because the user has forgotten how to operate the controls on the unit.
4. In some cases the fuses will blow as fast as they are replaced. The serviceman will have to test the line, receptacle, cord, and the connections in the unit, until he finds the short.

On many of these calls, the serviceman will spend only a few minutes, collect his minimum charge, and depart, shaking his head.

'MY COOLER RUNS, BUT IT DOES NOT COOL'

But on others, he may find real trouble—the unit will run, but it does very little, if any, cooling. The user may tell the dispatcher over the phone that the unit will run, but the serviceman may find when he gets there that only the fan is running and not the compressor. Perhaps the user had the Selector set on Ventilation instead of Cooling.

But with the Selector set properly, the compressor still may refuse to run, although the fan does. This could be due to:

1. Bad connection in the unit—on the Selector Switch or on the motor-compressor.
2. Faulty relay. Perhaps it is only sticking, or it may have developed corrosion, and might have to be replaced.
3. Starting capacitor faulty. It is not at all uncommon for the capacitor to fail even though not in use. Perhaps a loose connection developed between the foil and the terminal wires. Perhaps the paper punctured, when the current first came on, and is now shorted.
4. Thermostat set too high, or bad connection on the thermostat. Perhaps the thermostat itself is stuck in the open position.
5. Low voltage. The fans may run, but the voltage is too low for the motor-compressor. See test below for low voltage.
6. Motor-compressor stuck. Why? It ran all right last summer. If the system was not dry, acids can form, and over the winter months, corrode bearings, shafts, cylinders, and cylinder walls. Direct expansion air conditioners ordinarily operate at evaporator temperatures from

(Concluded on next page)

For more information about products advertised on this page use Information Center, page 66.

Spring Service on Room Units--

(Concluded from preceding page)

40° to 45°, so there is no freeze-up of the capillary tube or expansion valve to warn of excessive moisture in the system.

What to do? Replace the entire unit, or the motor-compressor. If the latter, blow out the entire charge and any oil in the evaporator. Blow the condenser, cooling coil, and lines with refrigerant, put on a drier, and charge the system.

If it is an expansion valve unit, use a liquid line drier; if a capillary tube unit, use a low-side (low pressure-drop type) between the outlet of the cap tube and the evaporator. Be guided by the instructions of the manufacturer of the unit.

'MY COOLER STARTS AND STOPS'

Or the compressor may start, but soon cuts off and short-cycles thereafter. Some of the causes of short-cycling of the motor-compressors are:

1. Low voltage. The voltage may be high enough to enable the motor-compressor to start, but it soon cuts off on the motor-protector. Low voltage causes high amperage, which may be high enough to kick the motor-protector.

2. Condenser dirty, causing high head pressure, which overloads the motor-compressor and kicks the motor-protector.

3. Condenser fan not running, also causing high head pressure and same results as in 2 which were explained.

4. Motor of condenser fan running too slowly. Could be low voltage, but more apt to be tight bearings. Causes excessive head pressure, and motor-compressor short-cycles on the motor-protector.

5. Running capacitor shorted or open. On some units, this may result in current increase that causes motor-protector to open.

6. Motor-compressor stuck. May not be stuck badly enough but that it will start, but it soon tightens and goes off on the motor-protector. Replace unit or motor-compressor as under "Motor-compressor stuck," above.

7. Motor-protector faulty. Less likely than some other things, but does happen. Replace with *identical* make and part number. Do not substitute.

'YES, THE MOTORS RUNS, BUT IT ISN'T COOL ENOUGH'

The serviceman may find that the unit seems to run OK, but it does not cool enough. The following are some of the most common reasons.

1. The most likely cause is that, during the winter or during late fall, a leak developed and now there is not enough refrigerant in the unit. Find the leak, repair it, and then recharge the unit with the same kind of refrigerant; and it's a good plan to put on a drier.

2. Another very common cause is simply a dirty air filter. This should be checked on any service call on a room air conditioner. If dirty, replace throw-away types, or clean the cleanable types. Never run the unit without the air-filter, even if it is dirty. If you do not have a new filter with you, dust out the old one the best you can, and put it back in temporarily.

3. Restricted or inadequate air circulation for any other cause: Cooling fan motor not running or running too slowly, fan blades bent, belts slipping (if belt driven fan) fan improperly located in its shroud, curtains obstructing return air louvers, etc.

4. Excessive humidity. Condensing moisture out of the air uses up lots of refrigeration, and even though the unit is in first class condition and normally big enough for the room, it may not be able to reduce the dry bulb temperature sufficiently on humid days. This can be helped temporarily by cutting off all outside make-up air, and cooling the recirculated air only.

5. Additional heat load. Perhaps more lights, additional appliances, television, electric organs, etc., have been put in the room during the winter. Perhaps a door is being left open.

6. Low voltage. May not result in enough over-current to kick the motor-protector, but may cause motor and/or fans to run at reduced speed and reduced capacity.

7. Stopped or partially stopped expansion valve or capillary tube, due to internal sludges or corrosion. Handle in much the same way as replacing the motor-compressor.

8. Motor-compressor inefficient. Broken valve, or other mechanical difficulty; or possibly caused by sludges or corrosion.

9. Oil in evaporator. Compressor oil may be over in evaporator. May be necessary to remove unit and tip to get oil to flow by gravity, to the compressor.

The above are not all of the things that can cause service calls on room air conditioners, but they are some of the most common ones that show up on a unit that operated reasonably satisfactorily the summer before, but gives trouble when starting up in the spring.

In the next instalment, we will discuss a few more service troubles on room air conditioners, describe how to check for low or high voltage, and outline a method of making a fairly accurate estimate of how much capacity in B.t.u. per hour that a unit is delivering.

(To Be Continued)

M-H Announces Randall Promotion

MINNEAPOLIS — Promotion of Dean Randall to advertising manager for Minneapolis-Honeywell Regulator Co.'s various Minneapolis divisions was announced recently by Eldon E. Fox, director of advertising and sales promotion.

Dean Randall

Randall, who has been assistant advertising manager for the past two years, will have responsibility for advertising for the firm's residential and commercial heating and air conditioning divisions, as well as aircraft, ordnance, and transistors.

Refrigerant Damage To Cellulose Paper Insulation Discussed

ATLANTIC CITY, N. J.—Evidence of definite reaction between cellulose insulating paper as used on motors and monochlorodifluoromethane ("Freon-22," "Genetron 141") at temperatures of 257° F. and above was presented before the American Society of Refrigerating Engineers at its annual meeting here.

This reaction is one of the factors that limits the temperatures which can be applied to motor windings in hermetic systems, believe the authors of the paper—H. M. Elsey and L. C. Flowers of Westinghouse.

The studies were made by heating test tubes containing paper strips and refrigerant.

After heating at 257° F. for one week, the paper had become so brittle that the strips could not be bent without breaking.

At the end of four weeks at this temperature, the paper had become dark brown in color and crumbled to powder.

Mitchell Room Unit Premium Boosts Distributor's 'Off Season' Sales 54%

CHICAGO—Proof that room air conditioners can be sold in the "off season" is furnished by a New York distributor for The Mitchell Mfg. Co. here.

Due to a pre-season retail offer made by Mitchell's New York dealers, Victor H. Meyer reports sales up 54% over a year ago.

Bob Shaw, manager, says this is even in excess of the "optimistic quota we have set for '56 which we expect to be the big year in air conditioning."

Under the Mitchell plan, a customer made a down payment for a 1956 air conditioner to be installed in the spring. In return he received an $80 Banquet Queen Electric Kitchen premium including a $59.95 electric rotisserie and a $19.95 electric fry pan. This program ran from October through December.

Mitchell now has a similar premium offer on electric blankets for a pre-season down payment or sale.

As evidence that the program works, Victor H. Meyer sold more than 1,000 of these premium deals to its dealers.

"This proves there are pre-season sales just waiting for the aggressive merchant who will plan to get them," says Howard Haas, Mitchell vice president in charge of advertising and sales promotion.

"Of course, the bulk of business still will come in hot weather, but with sound promotional plans, there's no reason dealers can't trade solidly in air conditioners all year long and boost their volume a minimum of 10%."

January Room Unit Sales In D.C. Area Up 89% over 1955

WASHINGTON, D. C.—Sales of room air conditioners, up to and including 1 hp., during January jumped 89% over the opening month of 1955 for major appliance distributors in the Washington, D. C. area.

Unit sales of each appliance were as follows:

Appliance	Jan. 1955	Jan. 1956
Room air conditioners	561	1,059
Refrigerators	3,398	3,440
Freezers	563	980
Dehumidifiers	52	19
Dryers	950	1,321
Automatic Washers	2,816	3,086
Conventional Washers	452	613
Dishwashers	391	785
Food Waste Units	660	639
Ranges	805	750

TWO Amana room units joined by Y-ductwork air condition the entire office of Dr. Charles Rhyon, Miami, Fla. optometrist. Units are installed in the workshop and Stanley Halpern, Major Appliances, Inc., Amana Florida distributor points out how ductwork carries cool air into reception room and three offices.

DUCTWORK passes through false ceiling to carry cool air to private offices in the Miami optometrist's building.

2 Room Conditioners Serve 5 Rooms In Fla. Optometrist's Office

CORAL GABLES, Fla.—Two Amana room air conditioners installed here as a central system are cooling a local optometrist's entire establishment of three private offices, reception room, and workshop.

Dr. Charles Rhyon, 58 Miracle Mile, is the optometrist whose air conditioning installation has been described as the "first of its kind" by Stanley Halpern, of Major Appliances, Amana distributor in Florida.

The 1½-hp. air conditioners are installed high in two windows in the workshop. A Y-shaped duct joins the two separate units there to bring the cool air through a false ceiling and into individual outlets in the reception room and each of the three private offices. The space cooled by the arrangement is approximately 70 ft. by 10 ft.

One of the air conditioners is connected to a time clock that turns the system on half an hour before the office is opened each morning to have it comfortably cooled before the doctor arrives.

One of the few problems that arose during the unusual installation was the question of whether the air-moving capacity of the fans in the air conditioners was great enough to allow the air flow to run the 60 ft. necessary to cool each room, despite static pressure present. To overcome that possible difficulty, a booster fan was installed at the Y-joint of the ductwork. However, it has not been necessary to use the fan.

The other problem was one of space — how to accommodate, even temporarily, the serviceman, his tools, and the ducts themselves in the cramped area of the false ceiling where the ducts were being drawn.

The workman overcame this difficulty by crawling on his stomach in the narrow confines and by using just one hand to hook up the ducts and to insulate the unit.

For more information about products advertised on this page use Information Center, page 66.

Design 'Know-How', Teamwork Solve Difficult Nursery Cooling Problem

MIAMI, Fla.—Arvida Orchids Nursery, South Miami, Fla., is now full-scale in business. But it took some special refrigeration design "know-how" to put the firm on the business map, reports Kelsey Sanders, of Sanders & Hollander, manufacturer's representative, located in Miami.

Sanders says the project, now complete, was a remarkable four-way team effort on behalf of equipment manufacturer, architect, consulting engineer, and contractor.

Project's owner, Arthur V. Davis, retained the architectural concern of Pancoast, Ferendino, Skeels & Burnham to design a building for the preparation and storage of cut flowers, he continued.

The architects retained the services of Jack E. Mitchell, consulting engineer, to design the required refrigeration system for the storage of cut flowers, mainly chrysanthemums.

Mitchell indicates the specified conditions to be maintained in Room No. 1, intended to be used for storage of packaged flowers, were 30-31° F. d.b.—with the normal humidity resulting from the standard form of refrigeration. However, the specified conditions to be maintained in Room No. 2 were 40-42° F. d.b. and 95% relative humidity.

Chose Product Coolers For Room 1

The engineer selected equipment manufactured by Drayer-Hanson, Inc., Los Angeles, to design the system around, specifying two Drayer-Hanson FTWD-4116 product coolers, for Room No. 1. Each unit is equipped with 8-row, four fins per inch, direct expansion coil, and arranged for water defrost.

A Paragon "defrost-it" time clock was interconnected with a refrigerant solenoid valve, fan motor magnetic line starter and water solenoid valve to automatically defrost each of the two units in Room No. 1.

In calculating the load for Room No. 2, the full product load was taken into consideration with the latent heat product load credited to the total sensible load calculations.

Mitchell determined that, insofar as humidity control was concerned, the specified conditions of 40° F. d.b. and 95% relative humidity would be increasingly difficult to maintain as the actual product load was decreased.

By comparison between the actual moisture content of the supply air and that of the room dewpoint temperature, Mitchell says he was able to determine the grains of moisture per pound of air room pick-up.

Having arrived at the c.f.m. of air required to absorb the room sensible heat, it was then easy to determine that approximately 25 lbs. of water per hour should be added to the room. This moisture addition could have been accomplished in many conventional ways, he says. Steam, however, was not available in the building.

Mitchell designed a pneumatic control system with room thermostat controlling a step controller to give 100%, 75%, 50%, and 25% refrigeration compressor capacity control.

Room Humidistat Controls Air Supply

A room humidistat controls the air supply to four Binks atomizing spray nozzles with a connection through a cumulator to a normally closed valve in the water supply line to the atomizing nozzles.

When the job was completed and balanced by the contractor, Sam L. Hamilton, Inc., a test run was made over a period of one week using a temperature and humidity recording instrument in the room.

Mitchell states that both architect and Arvida Orchids' Davis registered complete satisfaction to find that the installation as designed and installed, maintained a room temperature of 40-42° F., and the actual recorded humidity during several 24-hour tests ranged between 95% and 97%.

NARGUS '56 Equipment Forecast

Frozen Food, Open Type Refrigerated Meat, Produce Cases To Lead Parade

CHICAGO—A total of 23,500 members of the National Association of Retail Grocers plan to buy new equipment this year, with frozen food cases and refrigerated self-service meat and produce cases leading the parade, according to the February issue of *NARGUS Bulletin*.

In its special "Modern Stores Annual Report and Survey Issue," it is reported that purchases of shopping carts, mechanical checkouts, cash registers, store safes, conveyors, scales, and meat saws rank high in purchasing intentions.

Indicate Record Year In Store Construction

With the building boom still on, NARGUS members have indicated they will make 1956 another record year in new store construction, building stores that will be "frillier than ever and more expensive," it was also reported.

Among the features presented in the February *Bulletin* is an article which says that circular food stores may be the shape of the future, providing maximum selling area and the most efficient operation. The publication presents a circular layout for study and describes the advantages and disadvantages of the "round" store.

"Mathematicians long have known that a circle encompasses the greatest interior area with the least amount of exterior wall," the article points out. "For a business that could adapt itself to this shape, it would mean advantages cost-wise in the structure itself."

According to an architect there is 30% more shelf space in a round building than in a square one, and customers can see 70% more of the merchandise on circular shelves.

Unconventional Store Shapes Studied

"No conclusions on this unconventional plan are drawn," the article states. "It is possible and workable. Store shapes other than the conventional rectangle are being given serious consideration in retailers' planning. Don't be hampered by the faults of previous buildings in any new venture!"

A special article describing "The Food Store of Tomorrow" presents "some of the ideas now in the talking and experiment stage," such as "air curtain" entrances that eliminate entrance doors, multi-deck frozen food cases to increase frozen food display capacity 50% and more, closed circuit television so operators can observe all areas of the store, motorized shopping cars, and electronic lighting.

Tomorrow's Store Designed for Shopper

"Tomorrow's store will be designed around the shopper," the article forecasts. "Covered walks will offer protection from the weather almost from the moment the shopper leaves her car.

"Pick-up stations near the exit will eliminate need for carry-out boys. Loud speakers will flood the entire area with soft music, interspersed with shopping suggestions."

The entire store will be overlooked by a mezzanine, containing offices and customer service booths, the *Bulletin* predicts. "Either on the main floor or mezzanine will be leased service shops. A barber will cut Junior's hair, and shoe and tailoring services will be performed during Mother's shopping trip.

"A laundromat will allow her to do the washing while she shops, with no time lost waiting idly. A branch of the local bank will cash checks, accept deposits, write money orders, and offer banking services."

Indoor-Outdoor Thermostats Enable Automatic Heat Pump To Balance Unit Capacity with Heating, Cooling Needs

DETROIT—There are today approximately 12,000 air source heat pumps in use and, based on demand, "we fully expect to see in operation by the end of 1965 a total of 750,000 electric air source heat pumps," John G. Yergat of the Weathertron Dept., General Electric Co., declared here recently.

Yergat made his prediction before a joint meeting of the Michigan chapter of the American Society of Heating and Air Conditioning Engineers and the Detroit section of the American Society of Refrigerating Engineers.

He explained for the engineers the modulating control, supplemental heating, and automatic defrost operations on the Weathertron unit, outlined the advantages that heat pumps offer in residential use, and answered questions from the floor.

Heat Pump Termed Solution to Year-Round Conditioning Problem

Yergat asserted that the heat pump is the logical solution to the year-round air conditioning problem, combining as it does, both the heating and cooling functions in a single unit.

The Weathertron unit, he said, uses the normal refrigeration cycle for cooling and automatically reverses it for heating. Supplementary resistance heaters boost heating capacity when necessary.

Although different manufacturers have different physical arrangements, he noted, all air source heat pumps have the same basic divisions. These are an indoor coil, outdoor coil, motor compressor, and controls.

On the Weathertron unit, he noted, the entire refrigeration cycle—the heating and cooling plant—is a sealed unit replaceable by removing a few electrical connections and hold-down bolts, sliding it out, and slipping another unit in. This, he said, is a matter of approximately two hours.

Modulated Furnace Has Been Dream

"For years," Yergat declared, "the dream of furnace people has been to have one that they could modulate to meet the requirements of the structure, as dictated by external temperatures.

"To date combustion equipment can't be built that way. It's basically a one-flow rate.

"Our heat pump has the economy of a four-stage modulated design and adjusts automatically to varying conditions.

"To illustrate this, we can take the Weathertron performance characteristics as applied to a specific home unit at designated design conditions.

"For a -5° F. outdoor temperature, with an indoor temperature requirement of 75° F., you have a heat loss from the structure of 82,100 B.t.u.h. at -5°.

"This heat loss of the structure is a function of outdoor temperature. Thus, as the outdoor temperature decreases, the heat loss increases. . . . However, the heating capacity of the Weathertron unit decreases as the outdoor temperature decreases.

"That point at which the heating capacity of the unit exactly balances the heating requirements of the home is called the 'balance point.'

"In this example, the balance point occurs at 18° F. At this temperature and below, down to -5° F., the Weathertron unit is assisted by supplementary heaters, which are an integral part of the Weathertron system.

How Supplementary Heating Is Effected

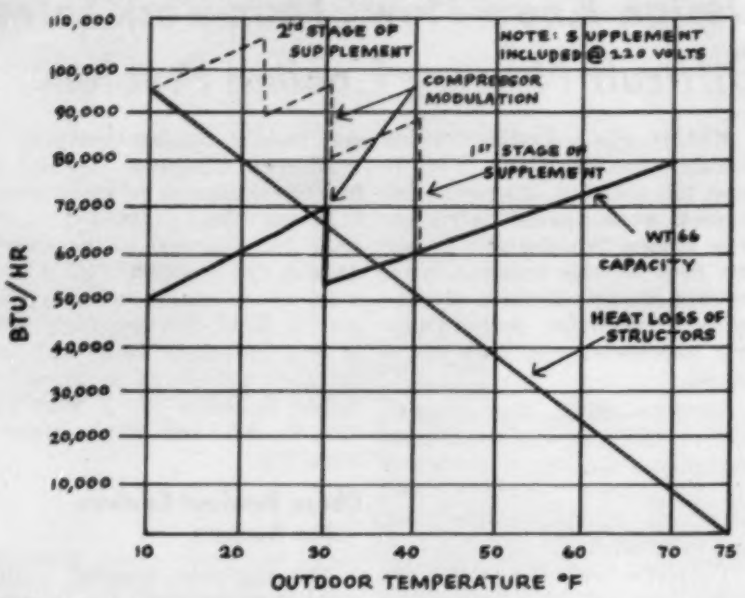
"For the example being considered, the first stage of supplementary heating is made available at an outdoor temperature of 40° F. When the outdoor temperature falls to 30° F., compressor modulation raises its capacity."

He explained that the Weathertron package includes a three-cylinder compressor. Above approximately 30° F., only two cylinders operate. At 30° and below, the third cylinder comes into operation. This modulation is automatically controlled by an outdoor thermostat.

Control of the system is automatically accomplished through a set of three thermostats—two outdoors and a two-stage one indoors.

The two-stage indoor thermostat has three sets of contacts. The cooling contacts are usually

PLUS-TEN-DEGREE DESIGN CONDITION -- CHART IV



GRAPH shows how first and second supplementary stages of heat pump capacity modulates the necessary B.t.u./hr. to meet home heating, cooling requirements according to outdoor temperature.

(Concluded on next page)

How to sell

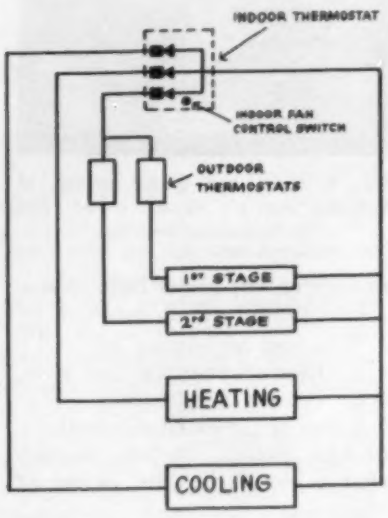
At left: The 25-story Oliver Building at Pittsburgh's Mellon Square has a long list of distinguished tenants. 50% now use the optional air conditioning; 80% are expected to use it by next summer.

Below: Close-up of Philco console unit for year-round heating and cooling. Tenants and management like the system, because individual tenants control their own temperatures.

For more information about products advertised on this page use Information Center, page 66.

Heat Pump Balance Point--

(Concluded from preceding page)



WIRING DIAGRAM of 2-stage indoor thermostat and two outdoor thermostats which are adjusted to attain balance point.

set at 78° F. The heating contacts are usually set 4° behind —or at 74° F. The third contacts act as indoor control for supplementary heating and are set 1¾° behind the heating contacts.

The first outdoor thermostat is set at 40° F. and controls the first stage of supplementary heating. The second outdoor thermostat is set at just above the point where the unit capacity, plus the the first stage of supplementary heating meets the heat loss of the house. It controls the second stage of heating. In this example, this occurs when the outdoor temperature drops to 5° F.

"Therefore," Yergat said, "at any point below the balance point, the heating requirements of the structure are automatically and promptly met by a combination of the Weathertron compressor and indoor and outdoor fan, operating continuously as needed, and one or two stages or supplementary heating."

Under certain operating conditions—high humidity combined with air temperature at or near the freezing point—on the heating cycle, the outside coil must be defrosted, Yergat declared.

Sensing Switch Causes Machine To Cycle

"In our machine," he explained, "a defrost sensing switch, actuated by the pressure drop across the outside coil due to frost formation causes the machine to cycle and it is defrosted by the 'hot' refrigerant.

"The occasions are normally infrequent, and the time required from 3¼ to 3½ minutes. But inasmuch as a defrost cycle is actually a cooling cycle, to prevent even the slightest temperature drop in the structure, we automatically bring in a certain amount of supplementary heat.

"This supplementary heat may also be brought in when the requirements of the structure exceed the capacity of the machine —a condition that, if proper selection and design have been made, will represent a very small percentage of the time."

Yergat declared, "Improvements in refrigerants, motors, and compressors, plus the economies of air source design have led us today to a packaged unit that can be installed anywhere, that needs only air and electricity, and that eliminates the use or need of water, combustible fuels, chimneys, fuel storage provision, and elaborate safety devices.

"Architects find true planning freedom with this unit, because they are freed from the restriction of flues, cross ventilation requirements, combustion area considerations, and can literally put the heat pump where they want—up on the roof, in the attic, in the utility room, down in the basement, or out in the garage—in areas of low cost per sq. ft.

"Builders share the same advantages, which in turn mean construction economies and a better home for the money—a competitive advantage in today's market.

Burning No Fuel Keeps Home Clean

"Heat pump homes are clean homes. Burning no fuel, heat pumps create no dirt," he said. He noted that heat pump homes are also safe, being flameless and fuelless; they are comfortable through low temperature heating and proper cooling; they are convenient with thermostatic control; and they are a good investment, designed to avoid obsolescence, thus protecting property values and providing better risk mortgages.

Answering questions from the floor along with Dan C. Codella, Weathertron field representative, Yergat made these points:

If 1½ cents per kwh. electric rates are available, the heat pump can compete favorably with 15-cent oil and 12-cent gas. They emphasized, however, that the heat pump is not a cheaper way of heating and cooling, but must be sold as the modern, finer way of life.

Installed cost of a heat pump would be from 20 to 25% over that of a year-round heating and cooling system using conventional fuels.

Special wiring will be required for the heat pump. In general, 100 amp service will be required for the WT44C Weathertron, which has a net rated cooling capacity of 39,000 B.t.u.; and 200 amp. service for the WT66C, which has a net rated cooling capacity of 56,000 B.t.u.

Conditioned Air Supplied At Constant Temperature

Maintaining proper relative humidity is not so much of a problem with the heat pump because conditioned air is supplied to the home at a relatively constant temperature on both heating and cooling—usually within 30° of actual room temperature. Because relative humidity is normally kept rather constant, there is little need to add or subtract moisture, unless, of course, the customer insists upon it.

They indicated that entering air temperatures on the heating cycle would not exceed 120° F. even with full supplemental heating.

The heat pump precludes anything but a warm air heating system.

The heat pump is at present 75 to 80% service reliable. No compressor breakdowns have been experienced other than normal difficulties, such as loss of gas.

No trouble has been experienced from water refreezing on the outdoor coil or in the drain. But G-E insists that the drains be installed indoors.

The heat pump is actually a little quieter than a year-round air conditioning system. But it should be sold, as far as noise is concerned, the same as air conditioning.

existing buildings on package units

Console room conditioners solve year-round heating and cooling problems at Henry W. Oliver Building, Pittsburgh, Pennsylvania

Expense and inconvenience make installation of central air conditioning a major problem in an existing building. To solve this problem, the management of a Pittsburgh office building devised an ingenious system using package units. Maybe their solution can help you sell similar prospects.

Steam coils mounted in Philco ¾- and 1-ton units provide year-round heating and cooling for tenants of the Oliver Building. Cost, including wiring, was 50% less than a central system.

Consoles adapted for heating at low cost

The system worked out by the building's engineers consists of a steam coil mounted in the plenum chamber of ¾- and 1-ton Philco room air conditioner consolettes. Total initial cost of installation was 50% less than the lowest bid for a central system. No major construction was required. The units fit into the mahogany decoration scheme and completely eliminate cast-iron radiators. System is optional to the tenants, and units can be moved at will to fit continually changing floor plans.

Above: A ¾-ton installation in a small office. Units are easily moved for changes in floor plan. They fit attractively into the mahogany décor, eliminating cast-iron radiators.

"Freon"* refrigerants best for air conditioning

The efficiency and compact size of the Philco units is due in part to the charge of "Freon-22" refrigerant in the cooling system. "Freon" is ideal for air conditioning, because it is the safe refrigerant—nonflammable, nonexplosive, and virtually nontoxic. For nearly 25 years Du Pont has been manufacturing "Freon" to strict laboratory standards. The result is a product of uniform purity which contributes to long, efficient service for all types of refrigerating and air conditioning equipment. On your next refrigeration or air conditioning job be sure to specify a system charged with "Freon" refrigerant made by Du Pont—the name you can depend on.

For further information on "Freon" refrigerants write to E. I. du Pont de Nemours & Co. (Inc.), "Kinetic" Chemicals Division 111, 2420-13 Nemours Building, Wilmington 98, Delaware.

KINETIC

FREON

SAFE REFRIGERANTS

**"Freon" is Du Pont's registered trade-mark for its fluorinated hydrocarbon refrigerants*

DU PONT

BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY

For more information about products advertised on this page use Information Center, page 66.

Transfin Tube Corp. Will Make Finned Tubes For Air Conditioning In Longview, Texas

LONGVIEW, Texas—Leasing of a building for Transfin Tube Corp., which will manufacture finned tubes for the air conditioning and oil-gas industries, was announced recently by N. J. Zacker, president.

Longview will be the headquarters. The plant will be operated in Greggton, three miles west of here.

Other officers of the corporation are C. T. Bappler, vice president; H. F. O'Hara, treasurer; and H. A. Kerr, secretary. Bappler is president of Keeprite-Eastern, Inc., Woodbridge, N. J., and O'Hara and Kerr also are officers of that company.

Machinery for Transfin Tube's plant is now being tested at Woodbridge.

Servicing Automobile Air Conditioners

BY C. DALE MERICLE

This is the second and last instalment describing the air conditioning system manufactured by Mobil-Aire Mfg. Co., Div. National Gas Equipment Co., Inc.

Makes previously discussed have included A.R.A. Frigikar, Automotive Air Conditioning, Pivot, Novi, Oldsmobile, Buick, Pontiac, Chevrolet, Ford Nash, and Mark IV.

Next make described in this series will be the automotive air conditioning system installed in Lincoln and Mercury cars.

FIG. 4—Clutch and blower controls of Mobilette unit are located at left side of evaporator housing.

MOBIL-AIRE (2)

Mobil-Aire Mfg. Co. Div. National Gas Equipment Co., Inc.
P.O. Box 122
Denison, Texas

Controls

Controls required for units of this manufacturer consist merely of blower controls and an on-off switch for the magnetic clutch.

For the larger systems (Mobil-Aire, ModernAire, and WethR-Matic) a control panel is mounted on the car instrument panel. It consists of two blower switches, one for each of the two blowers, and a toggle switch for manual control of the magnetic clutch.

Blower switches are of the three-position type with off, low, and high speed positions.

Mobilette unit controls (Fig. 4) are mounted directly on the evaporator housing. There is a toggle switch for the magnetic clutch and a three-position blower switch.

SERVICE HINTS

Evacuating System

Factory recommendations for evacuating systems made by Mobil-Aire call for running the car engine at low speed and holding a vacuum of 20 to 28 in. for 20 to 30 minutes. Compound gauge set, or course, is connected to system during evacuation.

If the vacuum will hold for several minutes after the discharge valve has been closed and the engine stopped, the system can then be checked for leaks with "Freon" in the system at a pressure of 60 to 70 p.s.i.g.

After checking for leaks, the system should be evacuated again as above.

Charging System

Refrigerant employed is "Freon-12."

Charge is approximately 4½ lbs. in the larger systems, and 2 lbs. in Mobilette units. Charge in larger systems can varv slightly due to different lengths of lines required for various makes of cars.

The systems are charged through the low side.

It is pointed out by the factory that in summer months it helps speed up operation and also keeps the engine cool if an electric fan is placed in front of the condenser during charging.

Normal Pressures

Discharge pressure will vary according to ambient temperature and compressor speed.

Suction pressure, however, should normally run about 18 p.s.i.g. Assuming that the system is otherwise working properly, a suction pressure of 18 p.s.i.g. can be obtained through proper adjustment of the expansion valve and thermostatic by-pass valve, the manufacturer advises.

Trouble Diagnosis

Insufficient cooling.

This can be caused by:

1. Compressor running too slowly due to a loose, slipping drive belt.
2. Expansion valve feeler bulb loosely clamped.

Remedy for (1) is to tighten idler pulley or compressor adjustment, and possibly to replace the belt.

Remedy for (2) is obviously to tighten the feeler bulb clamp.

Insufficient air circulation.

This can be caused by:

1. Blower running too slow.
2. Blower inoperative.

Loose or corroded connections, broken switch, or low battery charge could be the cause of (1).

Broken switch, faulty wiring, or faulty blower motor could be cause of (2).

High discharge pressure.

This can be caused by:

1. Condenser stopped with dirt, bugs, or other foreign material.
2. Air in system.
3. Moisture in system.

Thorough cleaning of condenser should remedy (1).

In the case of (2) and (3), the system should be evacuated, the drier replaced, and the system recharged.

Low suction pressure.

This can be caused by:

1. Expansion valve strainer stopped up.
2. Suction line restricted.

Remedy for (1) is to clean strainer.

If suction line is restricted due to external damage, it must be replaced.

Shortage of refrigerant.

Indicated by bubbles in sight glass, shortage of refrigerant usually results from leaks, which should be found and repaired before refrigerant is added.

Refrigeration Supply Co. In New Richmond Quarters

RICHMOND, Va.—Refrigeration Supply Co. has announced that formal opening of its new quarters at 1221-23 Admiral St. here will take place Friday, March 16, from 6 to 9 p.m., and Saturday, March 17, from 10 a.m. to 4 p.m.

For more information about products advertised on this page use Information Center, page 66.

N. O. Nelson Co. and Joplin Supply Co. Sold To Automatic Washer

NEW CASTLE, Del.—Bellanca Aircraft Corp. has announced the sale of its subsidiary, the N. O. Nelson Co. of St. Louis, and Nelson's subsidiary, Joplin Supply Co., to Automatic Washer Co. of Newton, Iowa.

N. O. Nelson is one of the country's largest wholesalers of refrigeration, air conditioning, plumbing, heating, and industrial supplies and equipment, and appliances and hardware. Automatic Washer manufactures combination washer-dryer appliances for household and commercial use, and metal signs.

Officials of Automatic Washer indicated that the company hopes to purchase similar firms under an expanded distribution program. Acquisition of such wholesalers "seems to be the answer to the small single-line appliance manufacturer," it was stated.

Bellanca received 950,000 shares of Automatic Washer (recent closing price Midwest Stock Exchange: $8\frac{1}{8}$) together with an outstanding Bellanca note of $1,220,000 recently acquired by Automatic Washer. During the time Bellanca owned N. O. Nelson Co., Bellanca received $3,466,800 in dividends from Nelson.

Bellanca's shares of Automatic Washer will represent more than 40% of the outstanding common shares of that company.

Mitchell 'Measure Up' Campaign Tailored To Dealer Needs

CHICAGO—An unusual direct mail program in which it will advertise products in addition to its own is being planned for room air conditioner dealers by The Micthell Mfg. Co.

The campaign also includes an incentive to encourage potential customers to come into the dealer's store.

Called the "Measure-Up" campaign, all material will be prepared by Mitchell but will be tailor-made for the individual appliance dealer.

Under the plan, three mailing pieces will be sent to lists of potential customers. Each will be personalized with the dealer's name.

Objective is to get the prospect to measure his room and window sizes, fill the figure in on a special coupon, and bring the coupon into the store. In return he is offered a 7-piece cutlery set worth $5.95 for only 98 cents.

In addition, Mitchell is preparing a mat-book containing ads from 36 to 40 products of other appliance manufacturers. From the book, the dealer may select nine products sold in his store and Mitchell will run three of the ads on each of the three mailing pieces.

Purpose of the program, according to Howard Haas, Mitchell vice president in charge of advertising, is "to enable the dealer to receive maximum benefit from the campaign and give him a chance to develop qualified leads by offering his customers a tangible return for responding to the mailing piece."

'Comforted' Bulls Relax, Reproduction Reacts

RALEIGH, N. C.—Bulls are being air conditioned at State college here to find out why heat causes them to lose their reproductivity.

In two comfortable chambers, four great Holstein bulls relax in cool comfort when the mercury climbs and the sun burns its brightest. All this is part of a 4-year test being conducted on the State College Dairy Farm by Dr. R. B. Casady, it was noted.

The animal husbandry expert said it is a known fact many animals drop off in milk, semen, and weight during summer months. And the college is trying to learn the reason behind this.

"Summer sterility" results from bulls taking 100° F. heat for even a few hours, Dr. Casady declared.

Copeland Educational Meetings To Start In Wichita March 12

SIDNEY, Ohio—A new series of educational meetings sponsored by Copeland Refrigeration Corp. and the company's wholesalers will commence March 12 at Wichita, Kan.

The meetings will be conducted by Dale H. Bodine, who has rejoined Copeland as manager of educational services. Bodine for more than 12 years was Copeland service manager, and for the past three years has been associated with Allied Sup-Co., Lima, Ohio.

Entitled "Copelametic — Person to Person," the program is intended to keep the wholesalers, manufacturers, and refrigeration dealers up to date on the continuing improvement in Copeland product design and applications. Copeland wholesalers will sponsor the meetings in their respective home or branch office cities.

Dealers and contractors in the area are invited to attend the sessions. In addition, distributors, dealers, field sales and service personnel of Copeland manufacturing customers, will be invited to attend area sessions.

The first swing will carry Bodine to the midwest. Superior Supply Co. will sponsor meetings on March 12 at the Gold Room of the Coleman Co. in Wichita, Kan.; and on March 13 at Superior Supply, 1819 Walnut Ave., Kansas City, Mo. The meetings will begin at 7:30 p.m.

The Dennis Supply Co. will sponsor evening meetings—also beginning at 7:30 p.m. on March 14 at the Castle hotel in Omaha; March 15 at the Jackson hotel in Sioux City, Iowa; and on March 16 at the Savory hotel, Des Moines, Iowa.

Following the midwest meetings, Bodine will swing over to the northern Atlantic seaboard states. Beginning March 19, the Melchior, Armstrong, Dessau Co. will sponsor a series of meetings at their branch offices in this area. The schedule for these meetings is as follows: March 19, Washington, D. C.; March 20-21, Baltimore; March 22-23, Philadelphia; March 26-27, Newark, N. J.; March 28, New York City; March 29-30, Brooklyn; April 2-3, Boston; April 4-5, Syracuse, N. Y.; and April 6, Buffalo.

The Melchior, Armstrong, Dessau sponsored meetings will be held at the office locations in the respective cities. Two meetings a day will be scheduled at 2:30 p.m. and 7:30 p.m.

Copeland plans to carry the program to every section of the country within the next eight months. Bodine will highlight the company's expanding product development program to this nationwide audience.

Government Contracts

SYNOPSIS OF PROPOSED PROCUREMENT

ARMY

Kansas City District Corps of Engineers, United States Army, 1800 Federal Office Building, 911 Walnut, Kansas City, Mo.

COMPLETION OF AIR CONDITIONING SYSTEM, Military Personnel Records Center, Overland, Mo. consists of furnishing, installing and connecting two 775 ton centrifugal electric motor driven water chillers, complete with water tower and chilled water distribution piping, and miscellaneous building work —Job—IFB 56-73—Bid Opening 5 April 56.

NAVY

District Public Works Office, Sixth Naval District, Naval Base, Charleston, S. C.

AIR CONDITIONING OF RADIO TRANSMITTER, BUILDING & RADAR CONSOLE BLDG., Marine Corps Air Station, Miami, Fla. Ten dollars deposit required for plans and specs.—Job—IFB 49792—Bid Opening 21 March 56.

Navy Purchasing Office, 4th & Independence Ave., Washington, D. C. Attn.: SPF-1A.

AIR CONDITIONING EQUIPMENT, CAP. 35 TONS, for operation on 440 volts, 3 phase, 60 cycles AC. Per Spec. MIL-R-16743C dated 7 Sept. 1955 with Modifications as indicated in the invitation. The material called for under this specification is of a type on the Navy Qualified Product List—12 ea.—IFB 600-787-56-6—Bid Opening 28 March 56.

Officer In Charge, Navy Purchasing Office, 180 New Montgomery St., San Francisco, Calif.

REFRIGERATED CASES FOR MEAT, FISH AND POULTRY, FROZEN FOOD, ETC.—2 units—IFB-220-12292-P2-E—Bid Opening 15 March 56.

NAVAL POWDER FACTORY, INDIAN HEAD, MD.

SPECIAL LOW TEMPERATURE CHAMBER—1 ea.—IFB-174-85-56 B—Bid Opening 26 March 56.

Bureau of Yards and Docks, Department of Navy, Washington 25, D. C.

DEHUMIDIFICATION MACHINES, FOB manufacturers plant, deposit of five dollars required—22 ea.—IFB 4406/56—Bid Opening 20 March 56.

AIR FORCE

Purchasing and Contracting Office, Patrick Air Force Base, Fla.

SERVICES AND MATERIALS for REPAIR OF HEATING SYSTEM AND INSTALLATION OF AIR CONDITIONING Building No. 250, Patrick Air Force Base, Fla.—Job—IFB 08-606-56-151-B—Bid Opening 30 March 56.

GENERAL SERVICES ADMINISTRATION

General Services Administration, Region 3, Business Service Center, 7th and D Sts., S.W., Washington 25, D. C.

AIR CONDITIONING SYSTEM FOR FOUR ROOMS—1 ea.—IFB FNW-3H-66300-A—Bid Opening 20 March 56.

General Services Administration, Region 4, Business Service Center, 50 Seventh St., N. E., Atlanta, Ga.

AIR CONDITIONING for basement work room, Orlando, Fla., Post Office—Job—IFB CR4-1261—Bid Opening 21 March 56.

General Services Administration, Region 3, Business Service Center, 7th and D Sts., S. W., Washington 25, D. C.

AIR CONDITIONING out-patient clinic and recovery rooms, U. S. Public Health Service Hospital, 31st and Wyman Park Drive, Baltimore, Md.—Job—IFBB GS-R3-B-4543—Bid Opening 22 March 56.

General Services Administration, Region 7, Business Service Center, 1114 Commerce, Dallas, Texas.

INSTALLATION OF AIR CONDITIONING EQUIPMENT in Air Reserve Center, U. S. Post Office (Old), Austin, Tex.—Job—IFB CR7563-320—Bid Opening 3-20-56.

General Services Administration, Region 4, Business Service Center, 50 Seventh St., N.E., Atlanta, Ga.

AIR CONDITIONING SYSTEM REPAIRS, Jacksonville, Fla.; Post Office and Court House—Job—IFB CR4-1269—Bid Opening 3-16-56.

General Services Administration, Region 5, 575 U. S. Courthouse, 219 S. Clark St., Chicago, Ill.

PARTIAL INTERIM AIR CONDITIONING FOR COURT, etc., for the U. S. Post Office, Courthouse and Custom House, Louisville, Ky.—Job—IFB C&R 308—Bid Opening 3-21-56.

General Services Administration, Region 5, 575 U. S. Courthouse, 219 South Clark St., Chicago, Ill.

PARTIAL INTERIM AIR CONDITIONING For Court for the U. S. Post Office and Courthouse, Hammond, Indiana—Job—IFB C&R 203.—Bid Opening 23 March 56.

General Services Administration, Region 7, Business Service Center, 1114 Commerce, Dallas, Texas.

AIR CONDITIONING, U. S. Post Office and Court House, Tyler, Texas—Job—IFB CR7561-92—Bid Opening 27 March 56.

AIR CONDITIONING COURTROOM, Court House, Corpus Christi, Texas—Job —IFB CR7561-100—Bid Opening 20 March 56.

CONTRACTS AWARDED THROUGH MARCH 6, 1956

Holloman Air Development Center, Holloman Air Force Base, N. Mex.

Replace Evaporative Coolers AF29(600)-827—$43,874—F. B. Co., Inc., 1780 Menaul Blvd., Albuquerque, N. Mex.

Chicago QM Purchasing Center, U. S. Army, 1819 West Pershing Road, Chicago 9, Ill.

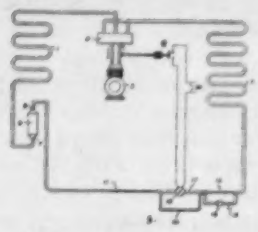
Refrigerator, Mechanical, Household, Size 8—IFB 56-235(B)—5,136 ea.—$491,977 —Frigidaire Sales Corp., 300 Taylor St., Dayton, Ohio.

PATENTS

Week of October 18

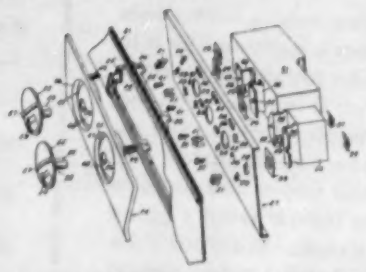
(Continued)

2,720,756. HEAT PUMP INCLUDING FIXED FLOW CONTROL MEANS. Gordon K. Stebbins, Clifton, N. J., assignor to General Electric Co., a corporation of New York. Application Dec. 29, 1954, Serial No. 478,465. 3 Claims. (Cl. 62—3.)



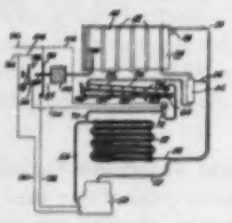
2. A heat pump comprising an indoor heat exchanger and an outdoor heat exchanger connected in a closed refrigerant circuit, motor-driven compressor and valve means in said circuit for effecting flow of refrigerant through said circuit in either direction whereby said pump may be operated on a cooling cycle with the indoor coil functioning as an evaporator or on a heating cycle with the indoor coil functioning as a condenser, and a flow restricting means in said circuit controlling the flow of refrigerant from either of said heat exchangers to the other heat exchanger, said flow restricting means comprising a plurality of series-connected capillary tube sections, a conduit by-passing one of said sections including normally open valve means and means for closing said valve means in response to a condition of operation of said pump to decrease the flow of refrigerant through said flow restricting means.

2,720,758. BREAKER STRIP AND CONTROL ASSEMBLY. Florence B. Anderson, Winnetka, Ill., assignor to Motor Products Corp., Detroit, Mich., a corporation of New York. Application Nov. 17, 1952, Serial No. 320,884. 6 Claims. (Cl. 62—99.)



1. In a refrigerator, a cabinet having inner and outer walls spaced laterally from one another, a breaker strip extending between said walls and removably attachable to the latter, a mounting plate positioned between said walls at the rear side of the breaker strip and secured to the breaker strip, a control unit positioned at the rear side of the mounting plate and secured to said plate, an escutcheon plate clamped to the front side of the breaker strip and having a circular recess at the front side thereof, an operating knob positioned within the recess and having a shank projecting rearwardly through openings in the escutcheon plate, breaker strip and mounting plate, indicia on the front side of the base of the recess forming a dial, and a window in the operating knob through which the indicia is visible, and means removably securing the shank to the control unit for operating the latter, said breaker strip, mounting plate, control unit, and escutcheon plate forming an assembly attachable to and removable from the cabinet walls as a unit.

2,720,759. REFRIGERATING APPARATUS. Lawrence A. Phillip, Detroit, Michigan, assignor to Nash-Kelvinator Corp., Detroit, Mich., a corporation of Maryland. Application April 14, 1953, Serial No. 348,615. 4 Claims. (Cl. 62—103.)



1. Refrigerating apparatus comprising, a cabinet, a removable separator within said cabinet separating a freezing compartment and a cooling compartment from each other, said separator having a drain for disposal of defrost water, a refrigerant evaporator within said freezing compartment, said separator extending beneath said evaporator in spaced relation thereto and having edges spaced from the cabinet walls to permit limited air circulation between the cooling compartment and said evaporator, a baffle plate to intercept drip water and ice falling from said evaporator on defrosting of the evaporator, said baffle plate disposed between and spaced from both said evaporator and said separator and inclined to discharge defrost water onto said separator adjacent the drain thereof, and a heater interposed between said baffle plate and separator in spaced relation to and above the latter and operable to heat both the baffle plate and separator on defrosting of said evaporator.

(To Be Continued)

CLASSIFIED ADVERTISING

RATES for "Positions Wanted" $7.50 per insertion. Limit 50 words. 15¢ per word over 50.

RATES for all other classifications $10.00 per insertion. Limit 50 words. 20¢ per word over 50.

ADVERTISEMENTS set in usual classified style. Box addresses count as five words, other address by actual word count. Please send payment with order.

POSITIONS WANTED

REFRIGERATION AND air conditioning man with 20 years' background of design, sales, installation and service desires to make connection with a company where this broad experience will be valuable. Prefer Southern location. Full information will be furnished upon request. BOX A5482, Air Conditioning & Refrigeration News.

EIGHTEEN YEARS' experience air conditioning industry in management, sales, engineering, construction with manufacturers, distributors and dealers. Prefer to remain in southeast but will go north or abroad. BOX A5485, Air Conditioning & Refrigeration News.

POSITIONS AVAILABLE

SERVICE ENGINEER — Headquarters' office needs experienced refrigeration and air conditioning service engineer to handle correspondence, bulletins and reports with overseas plants. Age, 30-40 years. College training preferred. State background, experience. Replies desired from metropolitan Detroit only. Write Frigidaire Service Manager, GENERAL MOTORS OVERSEAS OPERATIONS, General Motors Building, Detroit 2, Mich.

OPPORTUNITY FOR manufacturers' representative: To increase your earnings, sell a full line of freezers, beverage coolers, display cases, dual temperature reachins and walkins. We manufacture a quality line to meet competition. Territories now available, write HOWARD REFRIGERATOR CO., INC., 4745 Worth Street, Philadelphia 24, Pa.

MANUFACTURERS' REPRESENTATIVE with commercial refrigeration experience, now covering Michigan, Indiana, Midwestern or Southwestern states, to sell fast-growing line of commercial equipment. Write PAUL R. STEWART, 1712 John Street, Cincinnati 14, Ohio.

WANTED: ICE cream cabinet salesmen under 45 years of age and free to travel protected territories. Must be experienced in selling low-temperature cabinets direct to the ice cream manufacturer. As we are one of the oldest and largest manufacturers of low-temperature equipment, we offer a most complete line. Salary, commission, plus travel expenses, company benefits. Write direct to WEBER SHOWCASE & FIXTURE CO., INC. Attention National Sales Department, P. O. Box 11065, Kearny Station, Los Angeles 11, California.

FIELD SERVICE engineer required by food store fixture manufacturer. Must be free to travel, with 10 or more years' experience in commercial refrigeration and electricity necessary. Salary, expenses, life insurance, hospitalization insurance and other benefits. 30 to 40 years of age. Willing to move when the need arises. This company is growing and expanding its operation every year. Send photo and full facts regarding work experience, age, family status, etc. Reply to BOX A5450, Air Conditioning & Refrigeration News.

WANTED: COMMERCIAL refrigeration salesman—Old established West Coast manufacturer of a nationally-known line of refrigerated market fixtures has increased its production facilities to handle increased volume, making available opening in two choice territories. To qualify as our direct factory representative, you must be under 45, free to travel, experienced in the designing and layout of grocery stores, supermarkets, etc., and the sale of such refrigerated equipment direct to the user. Excellent remuneration based on salary, commission, and travel expenses plus company benefits. In replying, please include a resume of your background and experience which will be held in strict confidence. BOX A5470, Air Conditioning & Refrigeration News.

FIELD SALES managers—A leading manufacturer of residential air conditioning and heating equipment has several openings for experienced men due to major expansion. Address reply to BOX A5473, Air Conditioning & Refrigeration News.

FIELD ENGINEERS—A leading manufacturer of residential air conditioning and heating equipment has several openings for experienced men due to major expansion. Address reply to BOX A5474, Air Conditioning & Refrigeration News.

APPLICATION ENGINEERS — Home Office: A leading manufacturer of residential air conditioning and heating equipment has several openings for experienced men due to major expansion. Address reply to BOX A5475, Air Conditioning & Refrigeration News.

SALES ENGINEER capable of becoming sales manager, for an established Wholesale Distributor of nationally-known manufacturer of a complete line of residential and commercial year-round air conditioning equipment. Air-cooled window units, 2 to 15 h.p., commercial units and combination heating and cooling residential units. Must be able to assist present dealers and establish new dealers in the metropolitan area of Detroit. Past experience with dealer organization or factory training is desirable. Qualified men past 45 will be given consideration. For immediate interview write BOX A5483, Air Conditioning & Refrigeration News.

WANTED — PART time refrigeration and design engineer with refrigeration background for freezer manufacturer, Detroit area. Reply giving details to BOX A5484, Air Conditioning & Refrigeration News.

EQUIPMENT WANTED

URGENTLY REQUIRE several '54, '55, or '56 window air conditioners. Must be priced right for volume purchaser. ASSOCIATED MECHANICAL SERVICES, 2446 University Avenue, St. Paul, Minnesota.

EQUIPMENT FOR SALE

NEW IMPROVED Kesco automatic condensate water disposal pumps, for air conditioners, ice-cube bins and drinking fountains, featuring a 9 in. high 3 gallon welded heavy steel hot dipped galvanized tank, with 2 gallon emergency reservoir; ¾ pipe inlet 1½ inches from floor. 4 inches water in tank starts pump. At your local wholesaler.

MT. VERNON, Eastern Supply, 521 East Third Street
NEW YORK, Abco Refrigeration, 1615 Second Avenue
WHITE PLAINS, County Seat, 111 Central Avenue.

NATIONALLY-FAMOUS HERMETIC units at fabulous discounts! ⅛ h.p. to ⅓ h.p. domes from $29.50. Hermetic units with air-cooled finned condenser attached, ⅓ and ½ h.p., from $34.50. Complete unit assembly with fan-cooled condenser (less dome) for use with ⅓, ½ or ¾ h.p. dome, only $9.00. ⅓ h.p. static condensers—95¢ each. Many other parts at equal savings. All equipment brand new, ready for immediate shipment. Write or phone for descriptive literature. MANN REFRIGERATION SUPPLY CO., 440 Lafayette St., New York, N. Y.

AIR CONDITIONING value: 2 h.p. hermetic compressor F-12 230V. 1/phase HD200. 2 h.p. air cond. evaporator 23½" L x 16" H x 3½" W. 2 h.p. air cond. condenser 24" L x 24" H x 4½" W. Also included 2 ton F-12 T. X. Valve & dual pressure safety cutout switch. Complete matched component kit as described $179.50. Freight prepaid anywhere in the continental U. S. A. WALTER W. STARR, 2833 Lincoln Ave., Chicago 13, Illinois.

BUSINESS OPPORTUNITIES

FOR SALE, old established commercial refrigeration and air conditioning sales and service business in Pontiac, Mich. Unlimited opportunity for go-getter. Well established service business—National commercial sales franchises. Two trucks. Low overhead. Write giving brief personal background and financial references. PONTIAC REFRIGERATION, 6387 Hatchery Road, Pontiac, Michigan.

MISCELLANEOUS

FOR SALE, 20,000 sheets Armstrong Cork Board 2 x 12 x 36, in original cartons at $.70 per sheet in lots of 1,000 or over. Gore H. Beall, Executor, JOHN K. WENZEL, ESTATE, Wheeling, West Virginia.

For more information about products advertised on this page use Information Center, page 66.

Mitchell Offers New Models--

(Concluded from Page 1)

tors "designed to sell the air conditioning contractor as well as his products."

Mitchell said the "low-cost, highly-adaptable" residential air conditioners are completely waterless. The units are the RA-200 "for average-size homes," and the RA-300 "for larger homes."

Air Conditioner Consists Of 2 Parts

Consisting of two parts, each air conditioner includes a condensing unit housed in a single weatherproof cabinet, and an evaporator unit. The condensing unit may be placed in the yard, or in basement, attic, or crawl space.

When used with the existing fan, filter, and air distribution ducts of a warm air heating system, the evaporator unit can be located over the air supply of a low-boy furnace, under a counter-flow furnace, or in the supply air duct of a house for horizontal furnace.

With an accessory blower to distribute cooling through special ducts for homes with steam or hot water heat, the evaporator unit can be located in attic, basement, or crawl space.

Both air conditioners are single-phase, 230-volt, 60-cycle units. Safety devices include Mitchell's high-low pressure cutout and safety louver grills.

Dimensions are: Condensing unit—20¼ in. high, 24¾ in. wide, 29 in. long; vertical evaporator—17 in. high, 7 in. wide, 26¾ in. long; horizontal evaporator—8 in. high, 18⅞ in. wide, 26¾ in. long.

Carrying a suggested list price of $349.95, the 7½-amp., ¾-hp. room air conditioner can be attached to any 115-volt outlet without special wiring, according to Mitchell.

Window Unit Fits 27 to 50 In. Sizes

The compact room air conditioner will fit into windows as narrow as 27 in., yet is provided with accessory installation parts to accommodate windows up to 50 in. wide, the company said.

The unit operates on 110-volt, 60-cycle, single-phase alternating current.

Mitchell's new "pancake" units measure only 16¾ in. thick, 15 in. high, and 32 in. wide, and are "adaptable to any type of installation," the company said. It claims the units "have power equal to any high capacity air conditioner.

"In developing the ¾ and 1-hp. units, Mitchell engineers utilized findings of the marine and diesel engine field where the 'pancake' concept of highly compact engineering was pioneered," it was pointed out.

'Pancake' Unit Can Be Mounted Many Ways

"The unit can be mounted in many ways: through a wall, flush mounted in the lower section of a double-hung window, in a transom, entirely inside the room, half-in and half-out of the room, in the upper section of the window, through a midwall to avoid furniture, or in a casement window with no cutting or mutilating of the window necessary.

The ¾-hp. unit, model M-3366, operates on 115-volt single-phase, 60-cycle a.c. It has a suggested list price of $379.95.

The 1-hp. unit, model M-3066, operates on 230-volt, single-phase, 60-cycle a.c. Its suggested list price is $419.95.

Casement Models Have 5 Adjustments

On the "full capacity" ¾ and 1-hp. casement window air conditioners, dual knob controls provide for five adjustments. An automatic thermostat is included as standard equipment and "both units are high power factor corrected (more than 90%)."

"The units, which are equipped with translucent window fillers, can be installed in any standard casement window with the use of only ordinary hand tools and without damage to casement or window sill," Mitchell said.

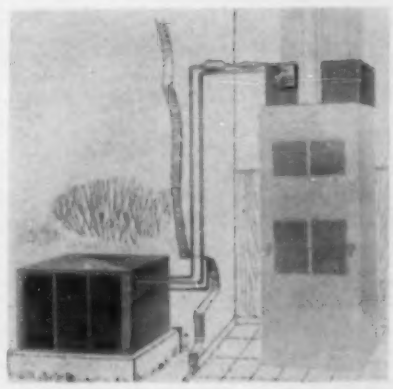
"The unit can be placed half-in, half-out of the room, or flush with the outside window line.

High Velocity Air Is Feature

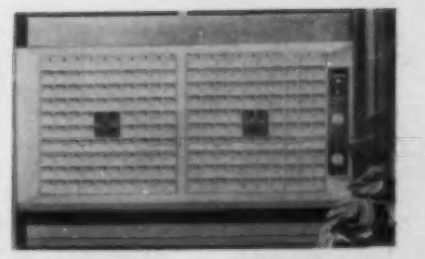
"The units feature high velocity air delivery with an efficient cooling system incorporating a V-type coil. Air is drawn into the unit through the side louvers and a fan mounted in front of the cooling coil 'pulls' the air through for uniform cooling over the coil surface."

Condensate "is quickly evaporated out the rear of the unit with the positive action afforded by Mitchell's new design condensate pickup," the company said.

The ¾-hp. model operates on 115-volt, 60-cycle, single-phase a.c. and the 1-hp. on 230-volt, 60-cycle, single-phase a.c. They have suggested list prices of $349.95 and $399.95, respectively.



REMOTE air-cooled "RA" residential air conditioner produced by Mitchell Mfg. Co., is available in 2 and 3-hp. models for small homes.



AVAILABLE in ¾ or 1-hp. size, this 16¾-in. thick Mitchell "pancake" air conditioner is said to be adaptable to nearly any type installation.

CASEMENT window air conditioner in ¾ and 1-hp. sizes is claimed by Mitchell to be capable of installation in any standard casement window without using hand tools.

For more information about products advertised on this page use Information Center, page 66.

C. WAMPLER

W. BYNUM

Carrier Names--

(Concluded from Page 1, Col. 3)

the annual sales of the corporation have increased from $19 million to $190 million and its net profits from $542,000 to $8,487,000. The gain in net worth has been from $4,079,000 to $80,472,000.

During the same period, employment has risen from 2,388 to 9,361 and the annual payroll from $5,118,000 to $45,998,000.

Bynum, 53, joined Carrier in 1930 as an engineering trainee, following his graduation from the University of Alabama and the Alabama Polytechnic Institute. After 16 years as a member of the field organization, he was made manager of the direct sales department handling "big" air conditioning in 1946.

He was named general sales manager in 1948 and the following year became a vice president. In 1952 he was elected a member of the board of directors.

The quarter-century which Bynum has spent in the air conditioning business has been entirely with Carrier. After going through its engineering school, he had a wide variety of engineering, sales, and executive assignments in Chicago, New York, Kansas City, Dallas, and Memphis. It was in 1946 that he joined the headquarters organization in Syracuse.

Bynum is a director of the National Association of Manufacturers, Marine Midland Trust Co. of Central New York, and the Syracuse Boys' Club.

American Radiator Appoints Clayton

ELYRIA, Ohio — Appointment of William H. Clayton as district manager for the southern United States has been announced by the Air Conditioning Div. of American Radiator & Standard Sanitary Corp.

W. H. Clayton

Clayton, who had been the division's district representative in Texas since March 1954, will be responsible for sales and engineering services to distributors and dealers in the south.

Wichita Contractor Puts All Facilities Under One Roof

WICHITA, Kan.—Fahnestock, Inc., heating and air conditioning firm, recently held an open house in its new quarters at 730 E. 13th St., where offices, shop, and warehouse are all under one roof, the contractor company announced.

For the past four years, the company has been located at 336 N. Water.

The new building was designed to Fahnestock's specifications, it was stated.

Officers of the concern are Ed Fahnestock, Sr., president and general manager; Ed Fahnestock, Jr., executive vice president; Fran Fahnestock, secretary-treasurer; and Ed. C. Blood, vice president and engineer.

What Will the Weather Be?--

(Concluded from Page 1, Col. 2)

Mountains. This favorable weather pattern and heavy price discounts produced record-breaking sales for so early in the year.

"In May, the south will revert to cooler conditions while the northern states, from New York to the Dakotas, will enjoy above normal temperatures. However, no extended periods of unusually hot weather are anticipated and the over-all weather affect on sales will be less favorable than May, 1955.

"Practically all of the midwest, from Chicago to New Orleans, will be warmer than normal in June. However, drier than normal conditions in this region may reduce the advantage of this well developed warm trend. Poor air conditioning weather is forecast for most sections in the north central and northwest states. Elsewhere, conditions will be near normal. However, the national sales outlook is considerably more optimistic than last June.

"The temperature outlook for July is completely in reverse of the actual pattern which occurred last year. The southeast and northwest will average above normal while northern New England and the north central states will be cooler than usual. In July, 1955, the west and a relatively small area in the southeast were the only sections in the entire country with cooler than normal temperatures. The Great Lakes region was especially hot and the country, as a whole, was unusually favorable for air conditioner sales. A repetition of these excellent conditions over an extremely wide area is hardly probable in the coming year.

"August should offer the best air conditioning weather of the season. Fully two-thirds of the country, from the Rocky Mountains to the east coast, will have above normal temperatures. Only the extreme four corners of the country, including New England, the Gulf states and the Pacific coast states will be cooler than usual. Last year, a similar warm pattern helped to produce excellent sales totals in many sections of the country during August."

Group Meets In Fort Wayne

FORT WAYNE, Ind. — The Fort Wayne section of the American Institute of Electrical Engineers announces that the Great Lakes District meeting will be held here April 16-18.

The theme will be "Engineering Futures Unlimited." Technical papers will be submitted.

For more information about products advertised on this page use Information Center, page 66.